ENGINEERING NEWS-RECORD

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When budgets say "No" STEELOX says "Yes"

Building dollars and school population are not always in balance. But harassed school officials and architects have found that with Armco Buildings of STEELOX construction they could provide exactly the same facilities at savings up to 50 per cent over other types of structures.

Building ideas have also changed in industry and on the farm. With the revolutionary STEELOX method the jointed panels provide both structural support and a finished surface. For sidewalls they save framing and outside covering. On the roof, STEELOX panels replace rafters, sheathing and roofing. Erection is simplified, appearance improved, and weathertight construction assured. Unskilled workmen quickly erect a low-cost, maintenance-free structure that is permanent yet has high salvage value.

Making products simpler, easier to handle and more efficient has been a prime goal at Armco for more than 40 years. So has the designing of products to meet specific needs.

Today you can bring your drainage and construction problems to Armco with full assurance you will receive all the benefits of long experience, extensive research facilities, and a real interest in helping you solve these problems.

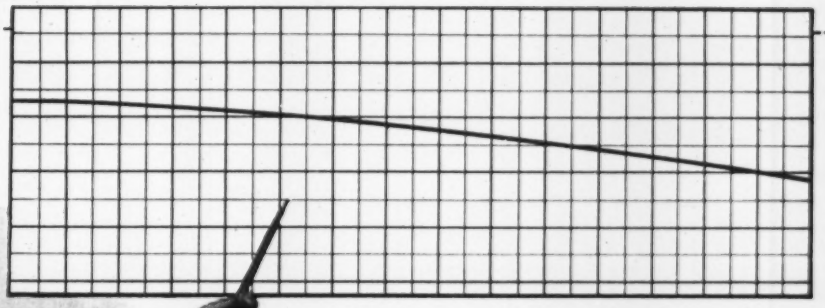
Armco has a complete range of engineered products and convenient, authoritative data to help you. If your problem is difficult or unusual, why not talk it over with us.

ARMCO

ARMCO DRAINAGE & METAL PRODUCTS, INC.

P&H Diesel Engines

(2-CYCLE)

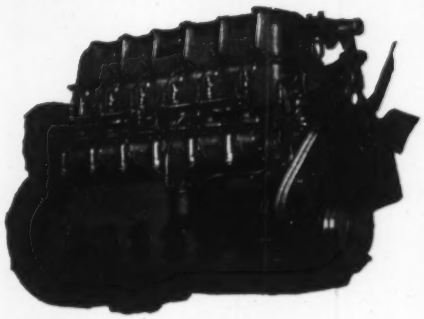


Can your diesels match this torque curve?

This is the torque curve for the P&H Model 687-C Diesel Engine. Note how the torque characteristics are sustained throughout its entire horsepower range.

That means steady, responsive power at all speeds — greater lugging "ability" for those toughest jobs. It's the kind of unfaltering performance that assures more profits in any service, constant or intermittent.

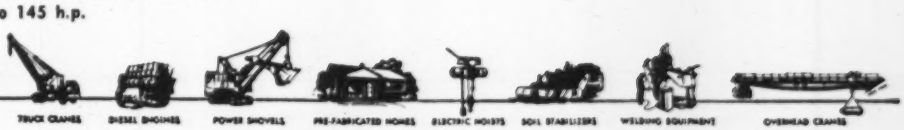
Steady torque for steady work is just another outstanding feature of P&H Diesel Engines — America's most advanced line. Ask your P&H Diesel representative for the full story. Or write for literature.



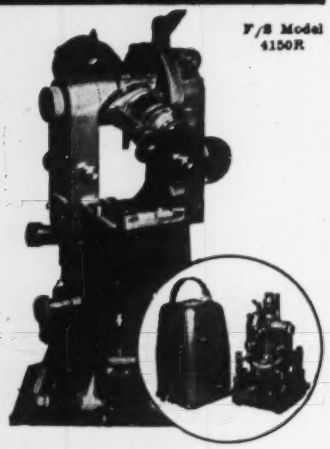
P&H Diesel Engines are built in 1, 2, 3, 4 and 6-cylinder models — up to 145 h.p.

P&H DIESEL DIVISION
HARNISCHFEGER CORPORATION
CRYSTAL LAKE, ILLINOIS

the P&H *Line*



F/S OPTICAL TRANSIT



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F/S Model 4150R special features include:
OPTICAL PLUMMET—eliminates plumb bob.
OPTICAL READING SYSTEM—vertical and horizontal readings to 6" at a glance thru reading scope next to telescope.
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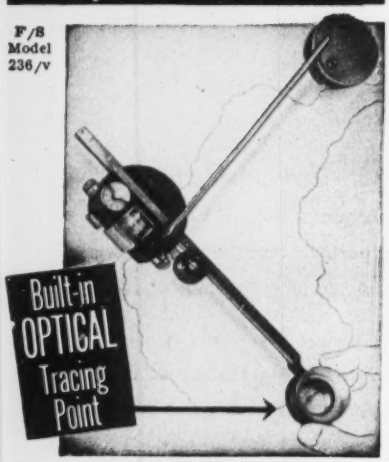
F/S Optical Planimeter

F/S Model 236/V



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- Finger-flick zero-setting control brings both wheels automatically to zero
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ENGINEERING NEWS-RECORD

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Volume 150 FEBRUARY 26, 1953 No. 9

WALDO G. BOWMAN
Editor

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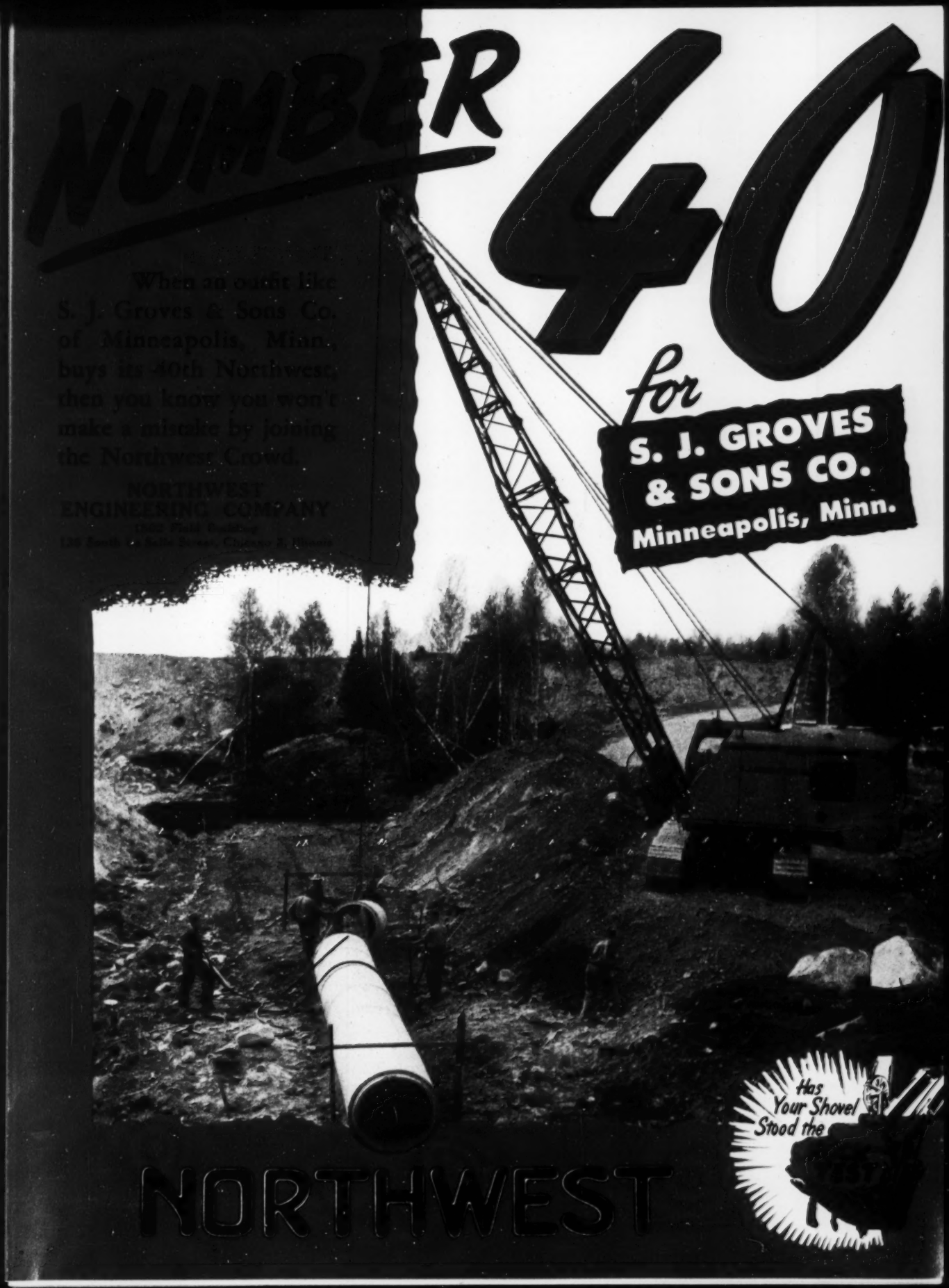
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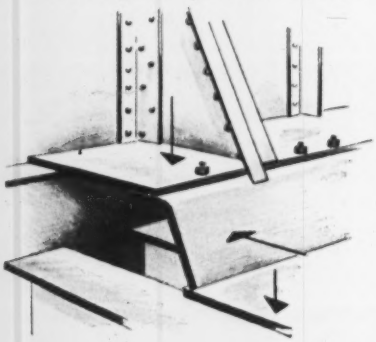
FOR ALL CONTRACTORS' EQUIPMENT

Bridge Deck and Curb Plates of Corrosion-Resisting Mayari R

This is one of the two railroad bridges used by the Chicago South Shore and South Bend Railroad over the Calumet Expressway at 130th Street in Chicago. They are parallel, through-plate girder structures, each carrying a single, main-line track.

The designers specified Mayari R low-alloy, high-strength steel for sections of these bridges that would ordinarily be subjected to severe corrosion. Deck plates and curb plates, for example, are made of this steel because they collect or hold moisture for longer periods than the vertical members.



The deck plates, 7/16 in. thick, are butt-welded together and secured to the carbon-steel floor beams by large plug welds. Each curb consists of a sloping side plate, butt-welded to the floor on one edge and bolted to a narrow top plate along the other edge.

Mayari R was used here, not alone for its excellent corrosion-resistance, but also for its superior strength. Tests conducted under a variety of atmospheric conditions have demonstrated that Mayari R will last five to six times as long as plain carbon steel. And as for strength, it has almost twice the yield point of structural-grade carbon steel.

Besides its use in bridges, towers and other railway structures, Mayari R is used in hopper cars, gondola cars, box cars and locomotives. Our Booklet 259 shows many Mayari R railway applications, and explains in detail the properties of this superior grade of steel. Write or phone for a copy.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

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Mayari R *makes it lighter... stronger... longer lasting*

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start your jobs now!

Protect your early start against costly bog-downs with a HYSTER Towing Winch mounted on a CATERPILLAR diesel tractor

You can get on the job early this year if you equip at least one tractor on each project with a Hyster Towing Winch (individual job requirements will determine the number of winches required). The winch's powerful line pull, plus the tractor's mobility, **makes sure all** your equipment is working **all** the time. With downtime kept to a minimum, maximum profits are assured.

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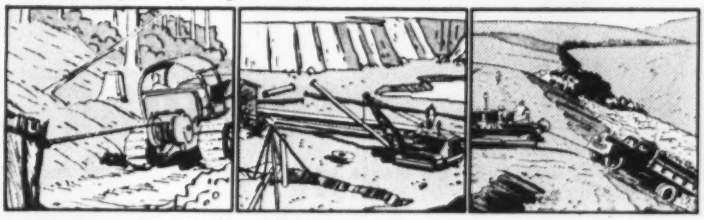
Hyster Towing Winches are rugged and dependable for heavy duty service. They are specifically designed for "balanced", matched mounting on Caterpillar-built tractors. See your Caterpillar-Hyster dealer for information, or write to: **Hyster Company, 2953 N. E. Clackamas St., Portland 8, Oregon.**

Hyster Towing Winches Have Many Cost-Saving Uses!



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BIRMINGHAM, ALABAMA

Secondary roads in Ionia County, Michigan, are among the finest in the country. Back of these roads is the experienced and expert supervision of Allen M. Williams, right, County Road Engineer and Superintendent, shown here with Howard M. Rotrock, Standard Asphalt Engineer.

First choice for secondary roads

More and more alert road builders, in the Midwest, are utilizing the benefits offered by Standard Oil's improved Road Oils to build better secondary roads at lower cost.

Through the use of these road oils, road builders gain a flexibility that is invaluable to good secondary road construction. Because Standard road oils do not harden excessively, roads laid with these oils can be reworked easily when necessary.

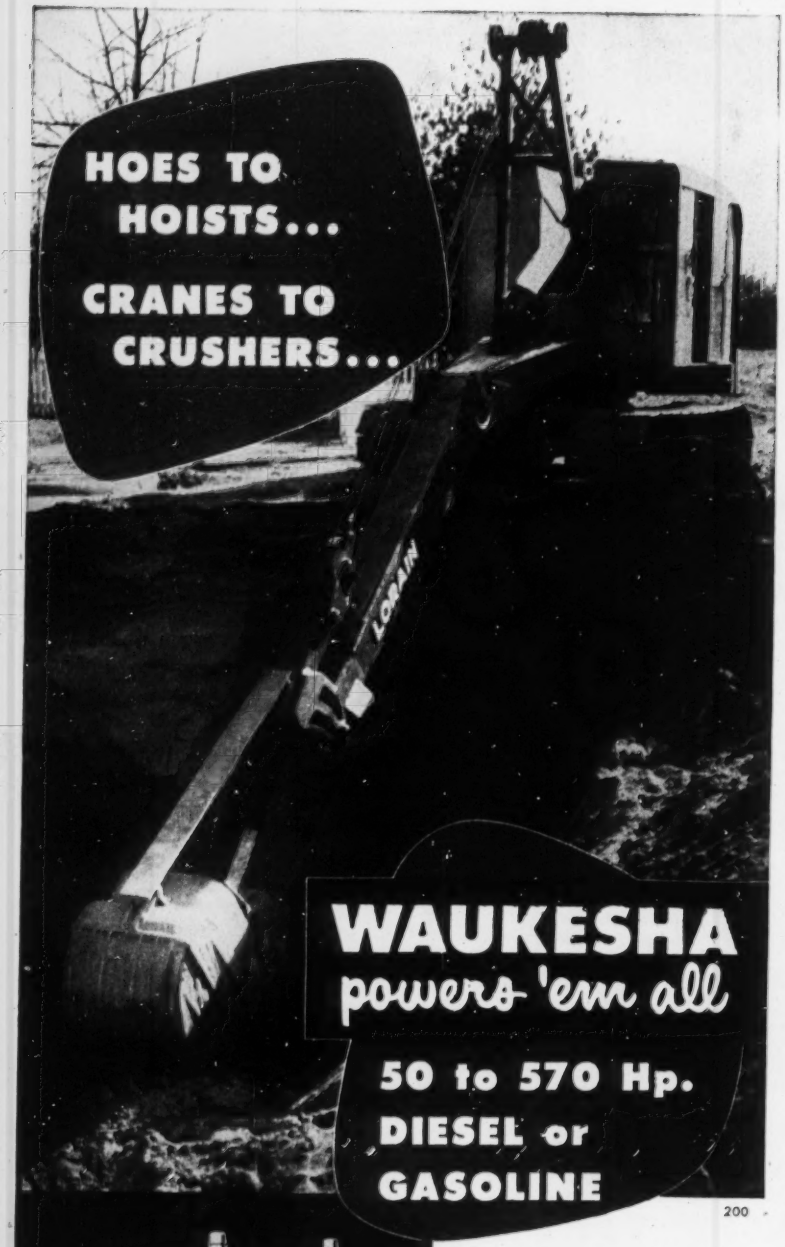
To help road builders in their work of developing better secondary roads, Standard Oil has improved its road oils to provide better coating of aggregate, greater binding quality, faster setting, and blacker appearance. That means longer-lasting, better-looking secondary roads can be constructed in less time and at lower cost.

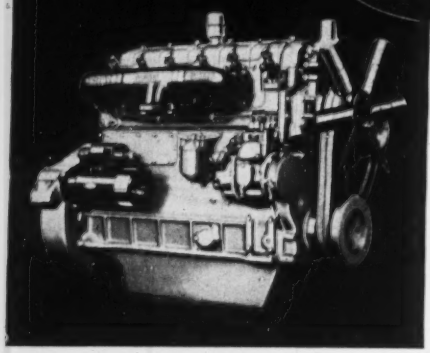
From any of Standard's four great refineries located throughout the Midwest, road oils and asphalt can be delivered promptly to your road-building job. You'll find a Standard Oil Asphalt Representative in your section of the Midwest. He's available and ready to help you at all times. You can contact him easily by phoning your local Standard Oil (Indiana) office. Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL

ROAD OILS

STANDARD OIL COMPANY (STANDARD) *(Indiana)*





135-DKB Diesel Engine—6 cylinders, 4¼-in. x 5-in., 426 cu. in. displacement. Max. hp. 147 @ 2800 rpm.

● Specially adapted to general contractors' needs, Waukeshas handle every load demand easily and eagerly, and with power to spare. Both the Diesels and gasoline engines are easy to start and operate. Waukeshas turn out more work, steadily and speedily. Economical to fuel and maintain. 50 to 570 hp. gasoline or Diesel. Get the complete Waukesha performance story in Bulletin 1079.

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READER COMMENT

Engineering teachers

Sir: I heartily commend the action taken by the National Council of State Boards of Engineering Examiners with respect to the licensing of engineering college staff members who teach professional engineering courses (ENR Dec. 25, 1952, p. 43). I heartily disagree with the philosophy on the subject as presented in your editorial (ENR Jan. 15, 1953, p. 164). This editorial does not, in my opinion, present a realistic attitude toward the subject.

The fundamental purpose of engineering education is to train men to enter the engineering profession and this entails the learning of some specific knowledge. The background upon which engineering judgment is based is composed of knowledge which we develop in three ways; (1) theory, (2) experiment, and (3) practice. Practice may be considered as a full size experiment on a long time basis.

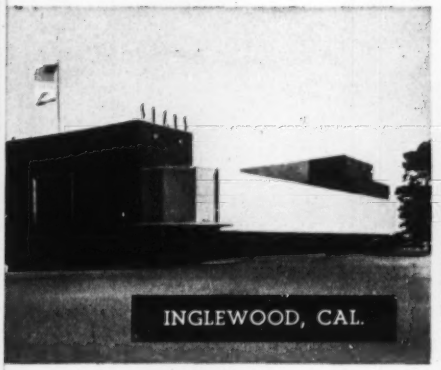
The emphasis in the engineering school is on the fundamentals of engineering, which includes the part played by practice. The professional engineering courses must emphasize the part played by practice. These professional courses teach only the fundamentals. They do not represent specialization. The part played by practice can best be taught by a teacher who knows practice first hand—by one who has the feel of the engineering profession. One cannot get this feel unless he has had personal and intimate contact with practice.

Furthermore, engineering teachers have the obligation to inculate a feeling of professional pride in the student. This cannot be done unless the teacher is a truly qualified engineer and is acquainted with conditions outside the "ivory towers." How can the teacher prepare the engineering student for life after graduation if he has not had the tempering influence of practice?

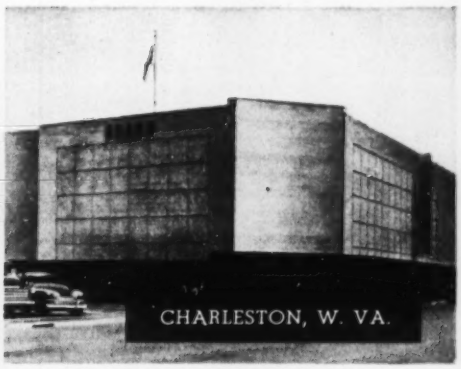
How can the defenders of academic freedom find anything objectionable in something which merely sets-up, what may be called, minimum academic qualifications? Are not the physicians who teach in medical schools required to be licensed to practice medicine in their states?

Sixteen and one-half years as a practicing engineer followed by five years as a teacher of professional engineering courses lead me to believe that the statement, "But neither the practical experience nor the license is essential

RAYMOND SERVES SEARS ROEBUCK



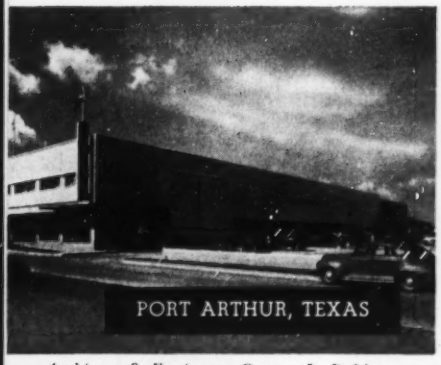
Architect: Stiles O. Clements.
Contractor: L. E. Dixon Co.



Architect: The Ballinger Co.
Contractor: Wise Contracting Co., Inc.

Architect: Stiles O. Clements.
Contractor: L. E. Dixon Co.

Sears Roebuck & Company continues to turn to Raymond for their foundation work . . . Sixteen different Sears stores (seven shown here) in ten States rest on Raymond piles . . . These repeat performances are further evidence that leading industrial organizations consistently utilize Raymond services for their important projects.



Architect & Engineer: George L. Dahl.

Architects: Shutze & Armistead. Engineer: Robert G. Lose. Contractor: A. Artley Co.

Architect: The Ballinger Co.
Contractor: Wise Contracting Co., Inc.

Architects: Shutze & Armistead.
Contractor: Merchant Construction Co.

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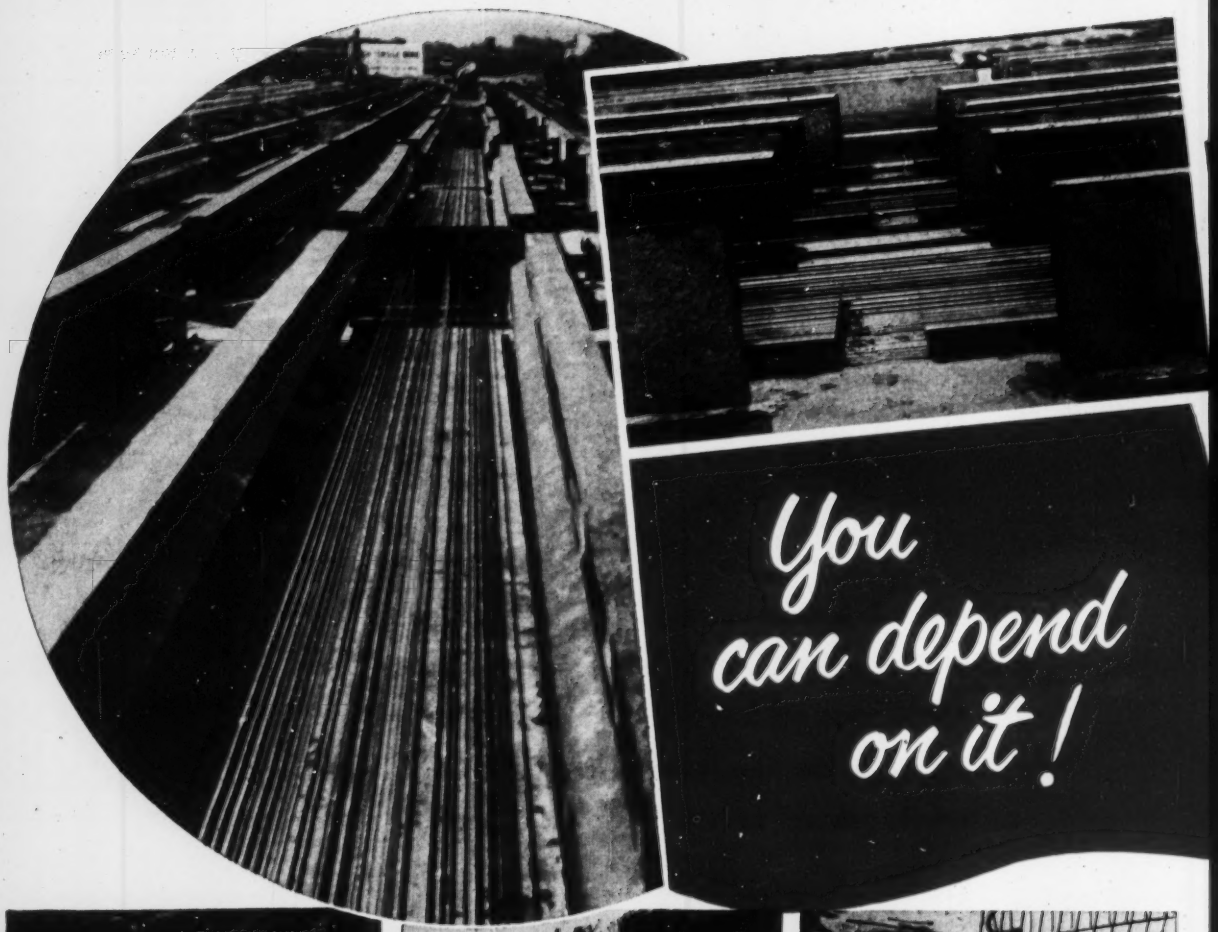
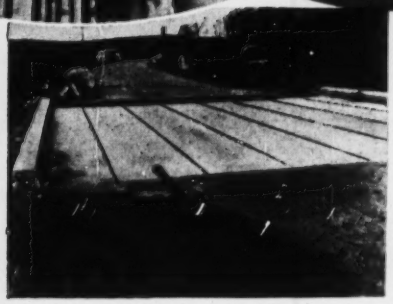
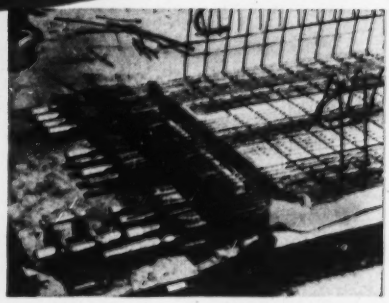


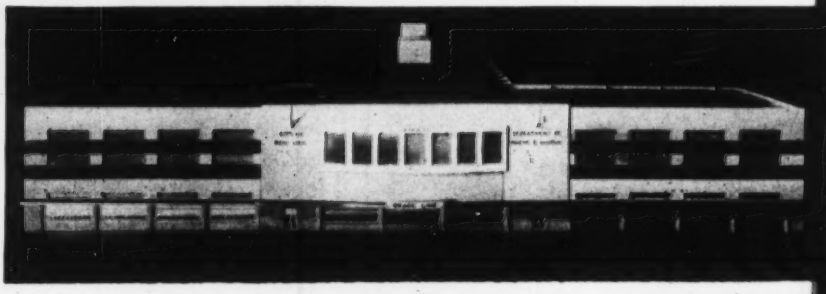
THIS PRESTRESSED high pressure concrete pipe line was installed at Hammond, Indiana, in 1939. Photograph shows installation of one of the earliest prestressed concrete pipe line installations in the United States. (Photo courtesy Price Brothers)



THIS PHOTOGRAPH shows the first pre-tensioned concrete bridge in the United States, erected in 1950 by Concrete Products Company of America. The Hockersville bridge, located near Hershey, Pa., was erected in 1 hr. 15 min., using American High Strength Reinforcing Strand. The bridge was designed for H 20 S 16 loading. (Photo courtesy Concrete Products Company)



THIS PHOTOGRAPH shows details of jack and anchorage of pre-tensioned wire on the Hockersville bridge. Note American Welded Wire Fabric used for stirrup reinforcement. This was a State Highway Project. (Photo courtesy Concrete Products Company)



MODEL OF PIER 57, New York City, now under construction using novel method of reinforced concrete box construction. Prestressed concrete stringers, incorporating American Super-Tens Wire will support the main deck. (Photo: Freyssinet Company, Inc.)

THESE PICTURES show the wire pattern, forms, and finished prestressed concrete stringers which are being used in the construction of New York's new Pier 57. American Super-Tens High Tensile Wire was prestressed by the Freyssinet Method.

AMERICAN *Super-Tens* WIRE AND STRAND

for Prestressed Concrete

EVER since the idea of prestressed concrete was introduced to the engineers of this country, American Steel and Wire Division has been producing high tensile wire and reinforcing strand for use in experimental and actual construction projects on prestressed concrete. Our long experience with steel wire and our research of this particular application have contributed substantially to the progress of prestressed concrete construction.

Our engineers have accumulated a vast amount of technical data in regard to pre- and post-tensioning problems and methods and the selection of the proper type of wire or reinforcing strand to achieve pre-determined stress requirements.

Our research has resulted in the production of U·S·S American Super-Tens Wire and Reinforcing Strand specifically designed for use in pre- or poststressed concrete. Whether you require high strength, high creep resistance, maximum ductility, good corrosion resistance, good concrete bonding qualities, easy handling or combinations of these qualities, we have or can design and produce the wire or strand you need. Our specially designed wire is being used in the great modern Pier 57 now being erected in New York City.

We welcome your inquiries as to the use of American Super-Tens Wire and Strand in the prestressed concrete applications you have under consideration. At your service, also, is the experience of our engineers to help you determine the proper, yet most economical, type and form of stressing materials to do your job best. Write for technical bulletins describing the properties of American Wire and Strand for Prestressed Concrete.

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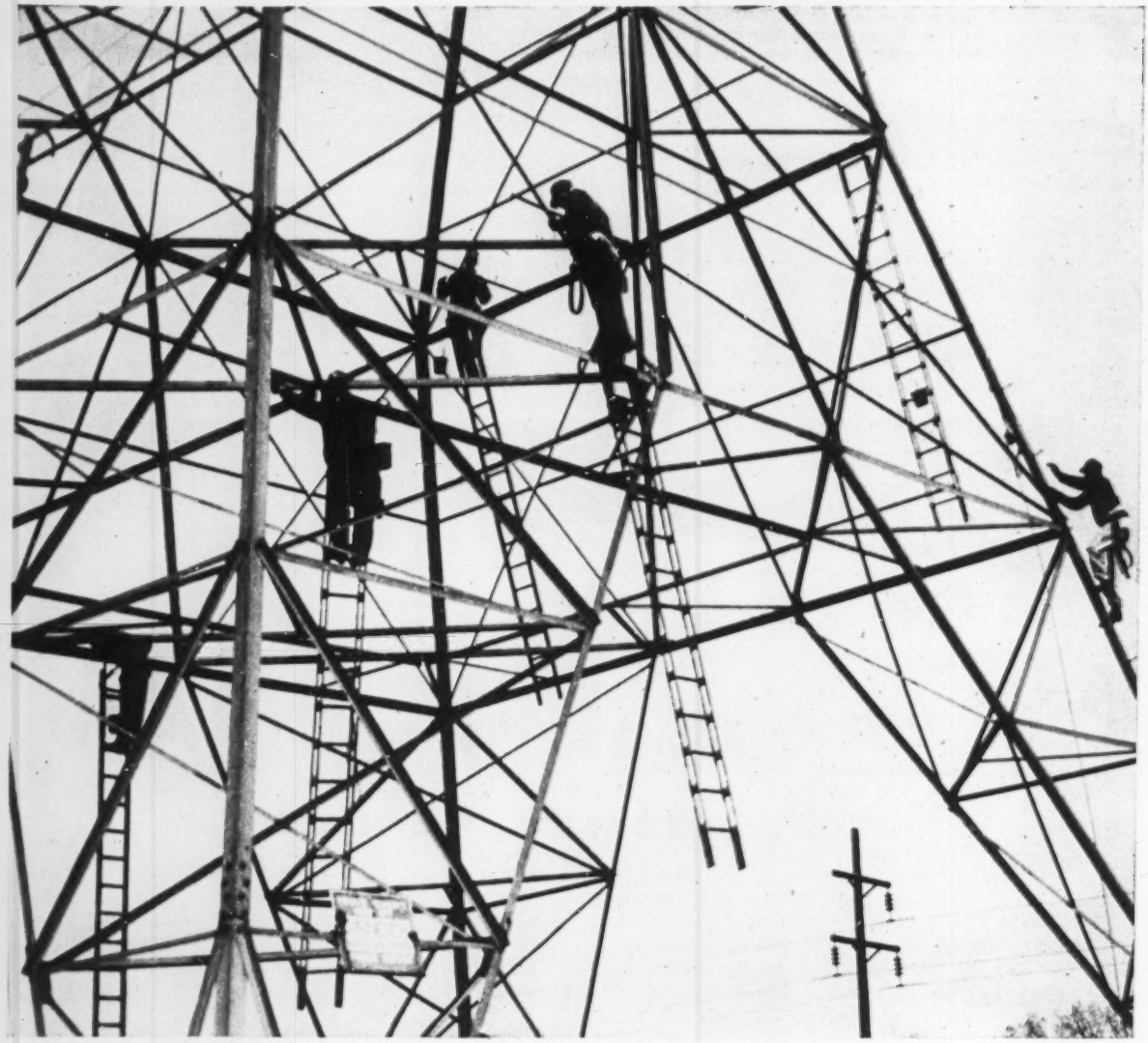
U·S·S AMERICAN *Super-Tens* WIRE *and* REINFORCING STRAND

USS

UNITED STATES STEEL



Tailored coat for all kinds of weather

To keep the wires up and the juice pouring, this transmission tower has to be tough. Yet its interlaced steel body is always exposed to destructive weather attacks. That's why these painters are giving the steel specially "tailored" coats of Du Pont DULUX Metal Protective Paints.

DULUX primers and top coats are chemically formulated to give remarkable adhesion and flexibility . . . inhibit corrosion from moisture and weather. What's more, DULUX flows out fast, smooth and level with excellent hiding . . . dries quickly and covers up to 600 sq. ft. per gallon.

On exposed steel surfaces, DULUX performance records stand at 10-year, 12-year and even longer periods of protective service—service that means real dollar savings.

So for all types of structural steel painting, consult the Du Pont Sales Technician in your area. Or write E. I. du Pont de Nemours & Co. (Inc.), Finishes Div., Wilmington, Del.

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DULUX METAL PROTECTIVE PAINTS

Chemically engineered to do the job better

READER COMMENT

to TEACHING the fundamentals of engineering," is untenable. It merely shows a lack of understanding of what comprises the fundamentals of engineering. Here, I am thinking of the fundamentals of engineering as approached in professional engineering courses, which are a necessary requirement for the education of one entering the engineering profession. Let us keep in mind the trinity upon which all engineering knowledge is founded—theory, experiment, and practice.

JOHN M. HAYES,
West Lafayette, Ind.

Name omitted

In an article printed in ENR Nov. 6, 1952, p. 88, under the title "Specific Gravities Determined Faster", the name of P. E. Ruplinger, 1212 Meade Street, San Diego, Calif., was inadvertently omitted as the author.

CALENDAR

Spring meeting, American Society of Civil Engineers, Fairmount Hotel, San Francisco, Calif., Mar. 2-6.

Association of State Highway Officials of the North Atlantic States, Hotel Traymore, Atlantic City, Mar. 3-6.

Ohio Society of Professional Engineers, annual meetin, Neil House, Columbus, Mar. 5-7.

Symposium on Air Pollution Control, Wagner College, Staten Island, N. Y. City, Mar. 7.

N. J. Sewage and Industrial Wastes Assn., Hotel Traymore, Atlantic City, N. J., Mar. 11-13.

N. Y. State Association of Highway Engineers, Hotel Statler, Buffalo, N. Y., Mar. 17-20.

American Railway Engineering Association, annual meeting, Palmer House, Chicago, Mar. 17-19.

Southern Municipal and Industrial Wastes Conference, University of North Carolina, Chapel Hill, Mar. 19-20.

Third Midwestern Conference on Fluid Mechanics, University of Minnesota, Minneapolis, Mar. 23-25.

American Congress, surveying and mapping, Shoreham Hotel, Washington, D. C., Mar. 23-25.

Conference on prestressed concrete, Newark College of Engineering, Newark, N. J.—Apr. 6-9-13-16-20-23-27 and 30—7:30 to 9:30 P. M.

Diamond Jubilee Convocation, Case Institute of Technology, Cleveland, Ohio, April 10-11. Topic "The Challenge of Free Men in the Atomic Age."

Concrete Reinforcing Steel Institute, annual meeting, the Carolina Hotel, Pinehurst, N. C., Apr. 27-May 2.

American Water Works Association, annual meeting, Municipal Auditorium, Grand Rapids, Mich., May 10-15.

Society for Experimental Stress Analysis, Hotel Schroeder, Milwaukee, Wis., May 20-22.

One Tournapull handles more than three loaders

When you want to know how much work high-speed Tournapulls can do per dollar, ask the El Paso Sanitation Dept. For over 2½ years this Texas city has used a D Tournapull to handle landfill garbage disposal plus scattered dirt-moving jobs. Their one 122 h.p. "D" consistently outproduces three big front-end loaders on the landfill operation, where 2700 yards of garbage have to be covered daily. In 6 hours on the dump, the "D" uses its dozer blade to spread 900 yds. of refuse and uses its 7-yd. Carryall-Scraper to load, haul, and spread 500 yds. of sand cover. In 16 hours, each of the loaders uses its 2-yd. clam bucket to place 600 yds. of refuse and 335 yds. of fill. That's 233 yds. garbage-plus-fill per hour for the ONE "D" versus 175 yds. for the THREE loaders.

"What's more," reports Dept. Supt. Ed F. Muckelroy, who is rated as having one of the top garbage disposal set-ups in the country, "we believe if we had the proper location for fill, the LeTourneau machine alone would do all of this work."

Does odd jobs in spare time

At present, the "D" utilizes its spare time to do odd jobs around the city and surrounding countryside. With 28 m.p.h. speeds on rubber, it drives safely over paved streets and through traffic. One day, it hauled 378 yds. of caliche over a 3-mile cycle in 8 hours. On another assignment, working a 10-mile cycle, it loaded, hauled and spread 1,275 yds. of fertilizer in 28 hours. It regularly handles maintenance of the mile-long access road to the garbage dump . . . doing a better job than can the Street Dept. graders, according to Muckelroy. "We're completely sold on the D Roadster because it's so easy to keep busy and because of its mobility," Muckelroy concludes.

D Tournapull can do more for your dollar too! Get proof on your scattered jobs . . . ask your LeTourneau Distributor for a demonstration.

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• **What's the pay?**—If you're among the many employers looking for bright young engineers just out of school, it'll be no surprise to you that starting salaries have been mounting steadily.

But how much, and how quick may be a surprise. The Illinois Institute of Technology at Chicago looked over its last graduating class, and then took a quick check on what's in prospect for this June's graduates. Conclusion they reached on the outlook:

Average salary a year ago in June was $325 per month. Average salary at start for graduates in February, $354 per month. Average salary likely by June, $360 a month.

Surprisingly, civils got the highest offers, averaging $364. Electricals were offered an average of $361, industrials, $356.

Not surprisingly, its February civil engineering graduates listed as chief inducements which they considered in accepting jobs: salary, type of work, location, in that order of preference.

• **Support for highways**—The American Automobile Association lent some powerful support to moves aimed at holding highway revenues for highway uses, when it completed organization of a Highway Modernization Conference.

The conference will draw up long-range policies for AAA and its member groups that will call for:

A fight for repeal of federal excise taxes on automobiles and accessory items—on the ground that this $2 billion yearly tax is not used for highway purposes; formulation of long-range state highway programs; and a continuation of AAA's long battle over diversion of highway revenues to other than highway purposes generally.

• **Loose end snipped**—Builders should take note of Direction 10 to CMP Reg. 6, issued shortly after the order that "open-ended" CMP controls (ENR Feb. 19, p. 44).

Direction 10 snipped a legal loose end left hanging when it became legally possible for builders to use all the material they could buy, if mills had space on their order books to take on the extra work.

The new directive makes it clear that it's also perfectly legal for a builder to begin a project with materials acquired beyond their quotas, without getting an okay from NPA.

• **Another St. Lawrence answer?**—While FPC hearings on New York State's application to build the U. S. half of the St. Lawrence Seaway marked time, Congress was busy thinking up new means of getting the seaway built.

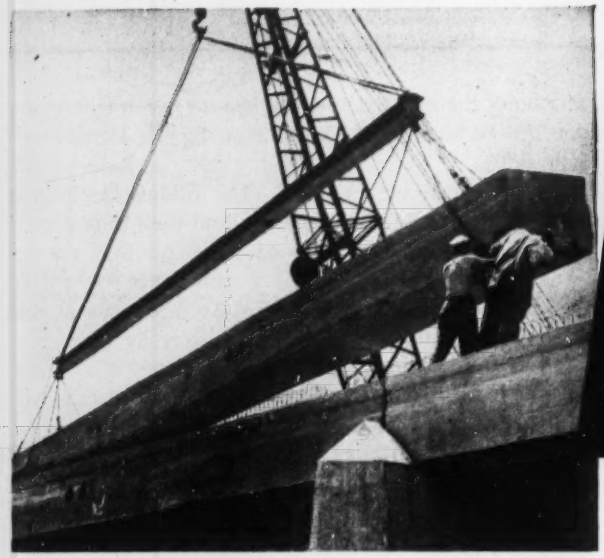
Latest scheme was embodied in identical bills introduced in both houses, under sponsorship of New York Sen. Herbert H. Lehman. His plan is:

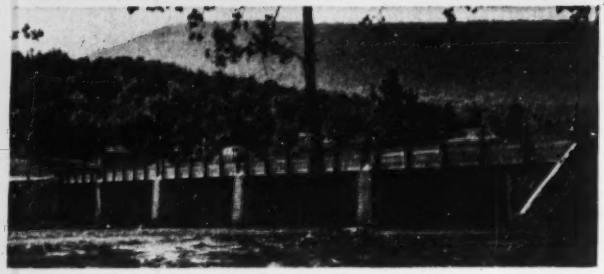
Set up a self-liquidating St. Lawrence Development Corporation to develop resources of the St. Lawrence-Great Lakes basin. Make it possible, once the development is completed, to sell to New York State the power facilities built and collect tolls (with Canada) for the seaway part of the works, to go toward liquidation of expenditures.

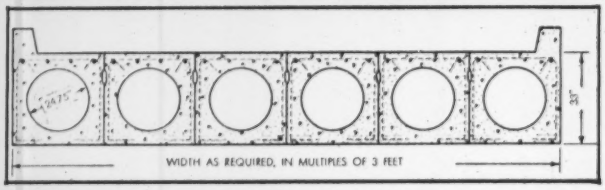
• **Old water fight renewed**—Illinois residents were girding for a renewal of an old fight over diversion of Lake Michigan waters—and their side in the battle depended on whether they live in Chicago or downstate.

The spark was a resolution, introduced by Chicago's congressional delegation to permit increase of diversion rates to 3,500 cfs. Objective: more water in the Illinois Waterway of the Chicago Sanitary District.

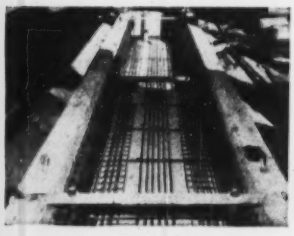
Downstaters, fearful of floods, are believed sure to fight the plan. They succeeded in defeating a similar move in the last Congress.

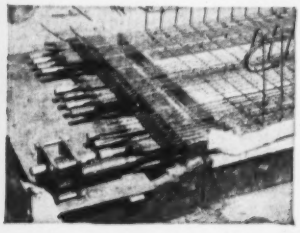






Typical cross-section of prestressed concrete bridge shows assembly of standard units 3 ft. wide. Top, views of Gleniron, Pa., Bridge. Below, anchorages for prestressing, spaced 120 ft. apart, have total capacity of 200 tons. Seven-strand steel cable, 0.25" diameter, is tensioned to 135,000 psi, in groups of ten. Using 'Incor', members are lifted 3-4 days sooner . . . maximum speed, minimum cost.





STRESSING the Advantages of PRESTRESSED Concrete

Prestressed, Precast Concrete Members Lifted 3-4 Days Sooner, using 'INCOR' 24-Hour Cement

● This 265′ prestressed, precast concrete bridge, with 25′4″ roadway, recently completed at Gleniron, Union County, by Pennsylvania Department of Highways—one of 73 bridges of this type, with clear spans up to 50′—consists of 45 prestressed members, each 53′ long, 3′ wide, 33″ deep, weighing 20 tons, produced by CONCRETE PRODUCTS COMPANY OF AMERICA with Air-entraining 'INCOR' Cement.

With 7 men and crane operator, MURPHY CONSTRUCTION COMPANY, Hummelstown, Pa., erected this bridge in less than a week. Cost: about 25% *less* than estimated for built-in-place reinforced concrete of conventional design.

Tensioning is usually applied when concrete attains 3500-4000 lbs. compressive strength. Dependable 'Incor' high early strength makes it easily possible to lift prestressed members 3-4 days sooner than with ordinary concrete. For high strengths, low water-ratio is necessary, and 'Incor' mixed with 4½ gal. water per bag of cement develops over 4000 lbs. in 48 hours.

COMPRESSIVE STRENGTH OF 'INCOR' CONCRETE

Max. Water Gal./bag	6 x 12-in. cylinders, cured moist at 70°F. Compressive Strength—p. s. i.					
	1 day	2 day	3 day	4 day	7 day	28 day
4½	3550	4550	5100	5450	6050	7000
5	3150	4050	4600	4950	5550	6450
5½	2750	3650	4150	4500	5050	5950

Dependable 'Incor'* high *ultimate* strength means that initial 'Incor' economies are matched by long-time durability and lowest annual cost—attested by over 25 years' performance of America's FIRST high early strength portland cement.

*Reg. U. S. Pat. Off.

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WASHINGTON OBSERVER

Administration's new housing man—ex-Rep. Albert Cole of Kansas fits the specifications Eisenhower's team laid down for the job. He knows the industry—but is not from any part of it. He has confidence of all elements in the industry. He voted against public housing in Congress but won't set out to scuttle any of the functions now located in HHFA.

•

The President's team wants to keep the housing boom going, but is figuring how it can be fitted in with the overall policy of tighter credit, higher interest rates, and a more stable dollar.

The fight over VA 4% loans is political. All hands agree that a 4½% interest rate would attract more mortgage money. But no one wants to take the political rap that comes with favoring higher charges to veterans.

A wide-open government market in Fannie Mae would insure against a housing slump. But the cost would be high. Low-interest rate mortgages would come right back to Fannie Mae. This would conflict with the administration's purpose of letting government financing meet the supply-and-demand test of the money market. So while a more liberal FNMA is talked, nothing will be done soon.

•

Senator Cordon of Oregon is a key man to watch on all Interior policies and projects. He is carrying more weight than chairman Hugh Butler of Nebraska. Cordon backed McKay, an Oregonian, for Interior Secretary—so is posted on day-by-day activities at Interior. Also, Cordon heads the Appropriations Subcommittee that okays Interior's funds.

First tip on reclamation policy may come this week in hearings by California Rep. Norris Poulson's subcommittee on irrigation and reclamation.

•

Construction hiring practices will get recognition in the Taft-Hartley hearings —but the amendments, when they come, won't answer all the industry's problems, by a long shot.

Union shop agreements signed before work begins on a job will be opposed by Walter Reuther, CIO president, because "it permits back-door deals." Closed-shop practices in construction would not be touched by any of Taft's amendments.

Key to T-H amendments is administration recommendations and it may be the end of March before they are known. Secretary Durkin has an advisory committee studying the problem, including construction representatives John F. O'Donnell, president of National Constructors Assn. and AFL president Meany.

•

How hard the economy drive hits construction will begin to show within a fortnight. By then Budget Director Dodge will have, in from the departments and agencies, reviews he ordered for fiscal '54 spending.

Access roads already have felt the knife. The House cut a $15-million request to cover new projects; this was at the request of Eisenhower's top transportation man, Commerce Undersecretary Blaine Murray.

Defense-area school building escaped Congress' first economy vote. The House overturned the Appropriations Committee by voting $20.5 million for defense-area schools; this was $3 million under the Office of Education request, but officials say it guarantees all the current program.

•

Watch the House Committee hearings on rivers and harbors and flood control. They start this week, and the decisions will affect the bulk of non-military construction for next year.

"Our railroad bridge is an

EYE OPENER

for anybody with an assembly problem"

"Whether you're assembling toasters or bridges," Ken went on, *"it pays to set your sights on fasteners."*

"Fasteners?" asked Jack.

"Right!" affirmed Ken. *"We've saved plenty by taking the RB&W man's advice to switch from rivets to high strength RB&W bolts in assembling high stressed structural joints.*

"These bolts stay tight and that saves us maintenance. They assemble faster, and that saves us labor and construction time."

There's a cost-cutting lesson for you in this story, whatever your industry.* So look to your fasteners for an often overlooked opportunity to reduce costs, and strengthen your competitive position. New inventions, like RB&W's SPIN-LOCK Screw, may prove more efficient than the fasteners you're now using.** Or you may save by the stepped-up production you get from using the finest fasteners... RB&W bolts, nuts, rivets and screws of uniform accuracy, dependability and physical properties.

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FEBRUARY 26, 1953

VOL. 150, NO. 9

ENGINEERING NEWS-RECORD

Building industry hails decontrols

Keener competition expected to lessen wage-price increases; faster and smoother materials flow seen

An ENR staff report

Removal of price controls on construction machinery, cement, lumber and other non-metallic building materials last week virtually completed the construction industry's return to a free market. "Open ending" of the Controlled Materials Plan (ENR Feb. 19, p. 44) a week earlier already had—to all intents and purposes—killed restrictions on use of materials.

Engineers, contractors and suppliers across the country lost no time in applauding the Administration's moves.

Only a few items of importance to construction remained under price control—mainly steel, copper and aluminum. But the days of even these controls were numbered. By April 30, all that is expected to be left on the books is authority for continued allocation of alloy steel, copper and aluminum to defense contractors.

It was a little too early for the industry to appraise the details of the effect of decontrol. But there was almost unanimous expectation of these developments:

- Price increases will be selective rather than across-the-board. Adjustments can be made without upsetting the over-all price level.
- Pressure for wage increases and fringe benefits will develop immediately, but the industry welcomes the opportunity to bargain without government interference.
- Competition will become keener and can be relied on to absorb price and wage readjustments, thus insuring stability.
- Termination of CMP will result in better distribution of supplies, faster deliveries and put the industry on a more orderly basis for planning and operations.
- Relief from red tape will speed work, may lead to cutting overhead, particularly for small contractors.

• **Cement likely to go up**—Although some Washington officials have been predicting sharp increases in construction materials and equipment on the basis of applications for ceiling increases prior to decontrol, industry spokesmen were confident increases would be selective and relatively minor. Industry leaders felt that growing competition would keep price readjustments on a realistic basis.

There seemed little doubt cement is one item on which some price increase could be expected fairly soon. A spot check on the heels of decontrol announcements last week indicated cement prices are likely to be held steady until near the end of the present quarter (March 31), since most companies feel bound by previous commitments to retain prices set for this period.

Although no cement company official would comment for publication, most of them took occasion to point out that while cement prices for the most part have held steady since early 1951, expenses have been rising steadily. Wages have gone up several times, as have other costs. Additionally, many cement makers—their plants running at near capacity almost continuously since the end of World War II—now face heavy repair and replacement charges for machinery and equipment.

• **Construction equipment**—No significant across-the-board increase in the selling price of construction equipment is expected. There will be some increases, naturally, say industry spokesmen. But they will be on a selective basis, and will come where competition permits and in spotty in-

(Continued on page 22)

Court referee rules against barring asphalt bids on Ohio Turnpike

A court referee has ruled that the Ohio Turnpike Commission should be required to take competitive bids for both asphalt and concrete construction on the 241-mi, $326-million toll road across northern Ohio.

The Turnpike Commission, according to the referee's findings, exercised "an abuse of discretion" in deciding to accept bids only for Portland cement construction materials.

The suit against the commission was brought by Robert H. Safer, president of the Ohio Road Improvement Co., an asphalt firm (ENR Dec. 4, 1952, p. 25, Nov. 27, 1952, p. 24). Turnpike attorneys will have opportunity to file exceptions and seek new hearings before the Second District Court of Appeals accepts or disallows the referee's findings.

Testimony at the hearings centered chiefly on efforts by lawyers for asphalt-paving interests in Ohio to show that estimates of the cost of bituminus paving used by the J. E. Greiner Co., Baltimore engineering consulting firm employed on the turnpike, were unrealistic. It was also contended that comparative cost figures submitted to the commission by the Greiner Co. did not cover all costs going into the two types of paving.

In a 32-page decision, court referee Robert P. Duncan wrote that the evidence presented showed there was "some kind of understanding or arrangement" between T. J. Kauer, chief turnpike engineer, and the J. E. Greiner Co.

The indicated agreement existed "as early as July, 1951, that only rigid pavement was to be considered," according to the findings of the referee.

The referee said there was "strong suspicion" that cement companies are violating a Federal Trade Commission order requiring them to "to cease stifling competition."

Duncan wrote that as a result of the hinted arrangement Greiner Co. ceased figuring on flexible pavement after July 11, 1951. The arrangement is further supported, the referee declared, by the fact that Kauer in August, 1951, made commitments with nine Portland cement companies to furnish material for the turnpike before the Turnpike Commission adopted the final Greiner report Sept. 4, 1951.

Duncan concluded that taking bids for both materials "is for the best interest of the people and taxpayers" and will result in material savings.

stances where manufacturers haven't been allowed to adjust their prices to compensate for increased costs of materials and labor.

Among construction men, there was little talk of what might happen to steel prices. A New York construction executive said that "the steel companies would be foolish to raise their prices again." Industry circles in Pittsburgh expressed belief that price increases were likely to come only from marginal producers.

• **Can rely on competition**—Contractors interviewed in St. Louis said they anticipated little change in building costs, even long-range, since competition in bidding has been keen enough to keep bids down even if no controls had existed. One said he would absorb any increase rather than pass it on.

In Washington, spokesmen for the National Association of Home Builders were confidently hoping for stability in over-all costs and the selling prices of homes.

• **Free bargaining welcomed**—Although construction spokesmen throughout the country were unanimous in anticipating a brisk round of wage demands, few seemed seriously concerned over the labor outlook.

Most of them felt the industry could take care of itself under hands-off collective bargaining and that wage increases would be about normal.

Big contracts will be negotiated for 46 northern California counties in the next 90 days and the unions will make many fringe benefits. But, says Paul Elsener of Swinterton & Walberg, San Francisco, "We look for more orderly bargaining when labor contracts come up for renegotiation."

"There will be an increase in wages, but we'll be in a much better bargaining position than we were before, and we won't have the rug pulled out from under us as we did last year," he declared. "Cases will be decided on their merits."

Discussing the wage outlook in St. Louis, where May 1 is reopening date for carpenters, laborers, iron workers, operating engineers, plumbers, laborers and roofers, Henry S. Till Jr., AGC manager, said that annual pay increases were granted under wage stabilization at about the same rate customary in previous years.

• **Better supply situation seen**—The phasing out of CMP was hailed as sound in principle and most general contractors were taking it for granted the supply situation would loosen up. At any rate, the contractors were expecting a better distribution of supplies, faster deliveries which would result in smoother working schedules.

Some Pittsburgh contractors spelled it out this way: Jobs can be speeded up because a contractor will be able to assemble his materials ahead of time as he needs them and in the quantities he wants and work will flow more smoothly. And, adds one contractor, "It won't be necessary to carry as much stock at all times."

On the light construction side, CMP decontrol was expected to stimulate recreation building activity which had been most affected by the materials control. Little effect on home building was seen.

• Steel supply outlook uncertain.—Effect on construction having big steel requirements was more difficult to estimate. Steel was reported still pretty tight on the larger construction jobs at the time of the decontrol order. Views expressed in Pittsburgh indicated steel company commitments through the first half of the year might prevent a noticeable easing of supply until the third quarter. Another important, though yet undetermined, angle was the federal government's current scrutiny of big defense and other public works projects. Cutbacks or postponements on this score, of course, would alter the over-all supply situation materially.

Long-Morse and other critical reports spur review of defense construction

The Lon-Morse Senate report criticizing the construction of overseas bases resulted in hearings before the Armed Services Committee at which Gen. Omar Bradley, Chariman of the Joint Chiefs of Staff, and Air Force officials testified.

Upshot was that defense officials will go back to the Pentagon and study the Long-Morse report together with other recent criticisms: the second report by Senate Preparedness Subcommittee criticizing wasteful procedures in construction of Moroccan air bases, the Sarnoff report calling for a 10% reduction in defense spending.

The Pentagon has conceded that there was waste in its Moroccan air base program but justified it on the need for haste. No further congressional action is contemplated now and military observers on the hill feel Congress should lie low and give the military a chance to correct some of the alleged abuses. It was pointed out that creation of the director of installations in the Pentagon is a check point designed to prevent some of the practices criticized in the reports.

However, one sure result of the critical reports is that Congress will take a long, hard look at any new legislation for military construction projects this session. In addition to the report by Senators Russell Long and Wayne Morse, the following developments contribute to the dim outlook for military construction legislation for fiscal 1954:

• Freeze and review on all military construction requests for authorizations and money by Defense Secretary Wilson.

• Report by House Appropriations Committee criticizing policy and operations of overseas-bases construction program.

• Report by House Committee on Expenditures in Executive Departments criticizing frills and fancy design on domestic bases.

• Reports of committees of both Senate and House criticizing Moroccan air base program.

• **Overseas methods hit**—The Long-Morse report came up with these criticisms of the overseas bases program.

• It found what it described as a "policy of waste" in decisions setting up size and cost of bases. It found that where a $200-million base had been authorized, in many instances a $100-million base would have filled the need.

• It found a hodge-podge policy of organizing work at projects visited.

In one case, the construction work was being done by troops. At another base it was done by native workers, at others by contract workers, air force, Corps of Engineers, or by the architectural-engineer himself. The report noted that as a result of its criticism of this lack of organizational coordination, a central construction agency has been set up to eliminate the above criticism.

The report was not satisfied with the way agreements had been worked out with the foreign nations concerned for the construction of the bases. It was the feeling of the subcommittee that field people, architectural engineers, etc., who have to supervise the construction work, should be called in on the working out of agreements.

• **Too many frills**—The report also found many instances of over-elaborateness of design and made the point that because the bases are intended for military use, they should be built to be operated with a minimum of manpower and materials, and are not to be used as experiment stations for new ideas or Rube Goldberg-type gadgets.

Army Engineers asking bids on runway of 15,000-ft at California air base

New federal construction may delay contract award on biggest air strip in construction history

Bids will be opened in Los Angeles March 20 for what probably is the biggest runway in construction history—a concrete strip 15,000 ft long, 300 ft wide and 16 and 18 in. thick. The announcement by the Los Angeles District, Corps of Engineers, (ENR Feb. 12, p. 19) did not say when the contract will be awarded—federal construction awards are now being held up pending re-examination of projects.

But all indications point to early release of this project for award. It will be built at Edwards Air Force Base in California's Mojave Desert. Edwards is a test center not an operational base. The strip is for urgently needed study on new aircraft types.

Officially, Edwards is the flight test center for the Air Force's Air Research and Development Command. Actually test work is carried out by all branches of the armed services and their contractors as well as by such other federal agencies as the National Advisory Committee for Aeronautics and the Civil Air Administration.

The new runway, designed for a 500,000-lb loading, will replace an existing 8,000-ft strip built during World War II for training purposes and designed for a 35,000-lb load. Considerable flight test work has been carried out from the bed of nearby Muroc Dry Lake. But the annual winter rains usually make the lake bed temporarily unusable—sometimes for months. Result is delayed and, hence, more expensive test programs.

• **No expansion joints**—The construction is expected to run in the neighborhood of $10 million. Besides the runway, the contract will include 7,000 ft of 100-ft wide concrete taxiway as well as almost 7,000 ft of 300-ft wide operational and a warmup apron, also of concrete. There will be substantial amounts of utilities such as electrical connections for starting jet planes, and much asphaltic concrete and oiled shoulder protection.

The concrete will be laid on 12-in. minimum thickness of compacted subgrade using natural materials. No expansion joints or longitudinal contraction joints are provided, but alternate bids will be taken on formed and sawed contraction joints. The pavement will be laid in 25-ft strips with transverse contraction joints each 25 ft filled with either a tar-rubber or asphalt-rubber sealing compound. There will be keyed construction joints between pavement strips and the outside joint also will include deformed tie-bar steel.

Thickness based on a 28-day concrete flexural strength of 650 psi will be 18 in. for 1,000 ft at each end of the runway as well as for taxiways and aprons. Elsewhere thickness will be 16 in. No special precautions are being taken for resistance to jet blast and jet fuel spillage except that the last 500 ft at each end of the strip be laid with heat resistant aggregate.

Major contract quantities include 387,600 cu yd of concrete pavement, 1,400,000 cu yd of excavation and 450,000 cu yd of borrow.

Design of the strip is based on estimates by the Air Force of ultimate feasible plane weight requirements. Planes such as the B-36 weigh 300,000 lb and the 500,000-lb design load is expected to accommodate future planes.

• **Special requirements**—Since it is to be a strip for plane research, there are special design requirements that normally would not obtain at operational trips. There are no breaks in the grade and the transverse grade for drainage purposes is limited to 0.5%. The length is based on experimental work and is not expected to establish criteria for operational strips.

A consistently hard surface is required for accurately measured takeoffs and landings. Asphalt was not considered suitable and concrete was selected.

The runway is only part of an overall program at Edwards designed to convert it from a temporary World War II training base to a permanent test base. Already under construction is a flight tower and roads and streets. Already built are new barracks and Wherry housing. And there is more building work to come along.

The Edwards work is planned by a special base development staff now headed by Lt. Col. M. P. Elvin. Planning surveys have been made at separate times by J. Gordon Turbull and Perreira & Luckman.

Design and construction of the facilities is handled by the Los Angeles District, Corps of Engineers, Col. W. R. Shuler, district engineer. Liaison with the Air Force is conducted by Air Force installations representatives with Col. M. Lutz, Jr., heading the staff for the Pacific Southwest.

Navy sinks oil

A new process for sinking oil slicks with carbonized sand has been demonstrated by the Navy in waters off Rhode Island. The specially prepared sand is sprinkled on oil slicks, causing them to sink to the bottom and remain there.

The carbonized sand is now manufactured by the Navy at Norfolk, Va., on a royalty basis. It costs the Navy about $20 a ton. Experiments show that slightly less than a pound of sand will sink an average film of Navy bunker oil spread over a square foot.

Navy's interest in removal of oil slicks is twofold—getting rid of fire hazards around docks, particularly fuel docks, and keeping harbor waters clean.

Carbonized sand is used foundry sand recovered from old casting cores and treated with creosote in a rotary kiln at 700 degrees F. When the creosote is burned off, the sand is left with a coating of greyish black carbon which has an affinity for oil.

Virginia urgently needs toll-road policy-making

Urgent need for toll highway policy-making confronts Virginia state officials as a result of a proposal made last week for construction of a 200-mi toll superhighway spanning the state from Maryland to North Carolina. Last year the legislature made the Department of Highways responsible.

The latest toll proposal was launched by the newly formed Virginia Interstate Turnpike Corp., headed by John J. Wicker, Jr., Richmond attorney. Wicker also is president of the old Dominion Turnpike Corp., which has proposed a 70-mi toll road in southwest Virginia. Still a third firm, the Commonwealth Turnpike Corp., has advanced plans for a toll highway to bypass Richmond and Petersburg.

The State Highway Commission is expected to consider the new toll-road proposal at its next regular meeting March 24. However, it seemed unlikely that any decision would be made prior to the commission receiving reports on two toll-road studies of its own not due until summer.

One of these studies concerns a proposed toll road from north of Richmond to south of Petersburg and another deals with a projected toll highway in the Washington area of northern Virginia. Both would parallel and could be expected to be in competition with the cross-state toll highway now proposed.

Federal commission proposed for Missouri basin development

Study group appointed by President last year favors centralized planning for water-resource projects

Establishment of a Missouri Basin Commission to prepare a comprehensive plan for the development of the water and land resources of the Missouri River valley and to direct its execution is recommended in the report of the Missouri Basin Survey Commission, which was made public last week.

The commission says that it is not recommending a "Missouri Valley Authority," but rather "an agency with broad powers to direct and supervise the federal agencies in carrying out their development responsibilities."

The survey commission was set up by President Truman about a year ago "to study the land and water resources of the Missouri River Basin and to make recommendations for the better protection, development and use of those resources."

The proposed Missouri Basin Commission would be a five-man body appointed by the President with the consent of the Senate. That plan is not favored by three of the eleven survey commissioners. Instead they would prefer a coordinating agency set up by compact between the basin states and the federal government, with commissioners appointed by the states and the federal government.

• **More local responsibility**—The survey commission is of the opinion that in water resource development the current trend toward lower reimbursement responsibility should be reversed. It favors a general revision of national policy to obtain higher contributions by beneficiaries, more systematic cost sharing and greater willingness to assume obligations on the part of groups immediately affected.

Most of the cost of flood-control and navigation projects, the commission says, now are charged off as nonreimbursable. The commission also raises the question as to whether there should not be toll charges on waterway projects.

• **Current projects reviewed**—The commission reviewed the current flood-control, navigation, power and irrigation projects in the Missouri River basin. It gives navigation developments lowest rating and questions whether the present 9-ft channel improvement work should be continued.

Concerning flood control, it affirms that new plans for protecting Kansas City, Mo., and Kansas City, Kan., should be made, and that the flood-control benefits of reservoirs ought to be appraised realistically before continuing construction of the controversial Tuttle Creek Reservoir. Zoning of flood plains is proposed as a condition precedent to federally-financed flood-control work.

Completion of the main-river dams that now are under construction is favored, including Oahe Dam, but a further study of other projects is recommended before any additional work is started.

• **Disagreements on costs**—The commission notes that three items of construction cost amounting to $1.2 billion are at issue between the Corps of Engineers and the Bureau of Reclamation as a result of lack of definite national policy. The dispute centers around whether the items are to be allocated to irrigation, flood control, power or navigation.

• **Commission functions**—Members of the proposed Missouri Basin Commission are to have overlapping 9-year terms and may succeed themselves. The commission is to prepare a land and water development program for the entire basin into which present plans of federal agencies are to be incorporated to the extent that they are compatible. All future projects are to be submitted to it for review as to engineering and economic feasibility. It, in turn, is required to report to Congress through established channels of review in the executive office of the President, including its recommendations and those of state and local groups.

The commission would be required to seek the advice of state governors and appropriate state agencies on projects under study before it gives its approval to them.

Three days before its official unveiling, the Missouri Basin survey commission's report was being shot at by opponents. Opening blast, charging that it advocates "a disguised Missouri Valley Authority," came from Breck Moran, president of the Wyoming Development Association and chief of the resource development division of the Natural Resources Board of Wyoming.

Citing two recent resolutions passed by the legislature, Moran declared: "Wyoming favors a planning and operating commission for the Missouri watershed, set up freely by compact among the 10 basin states and the federal government. We strongly oppose the creation of a superstate, run by Washington, usurping our rights, laws, customs, powers and sovereignty, reducing Wyoming to a geographical rectangle."

Kentucky to assess damages for delays

Contractors failing to meet specific schedules on public projects in Kentucky face payment of damages to the state, under new contract clauses announced by W. T. Judy, executive director of the State Property and Buildings Commission.

All contracts for major construction will carry a clause providing that "the time allowed for completion will be —— calendar days." Another clause will provide moderate penalties—"$5 or $10 a day"—for failure to meet stipulated schedules. Kentucky highway contracts already contain such clauses. Extension of the policy was precipitated by recent long delays on public building jobs.

State Attorney General Jo M. Ferguson advised the building commission not to label the clause as a "penalty clause" but to use the words "agreed damages". He said that the contract provision is "to establish a fixed sum of money agreed to by both parties as representative of the actual damages which will be sustained by the commission if the contract is not completed on time."

Officials of the Associated General Contractors in Louisville said they would "wait and see what the bid advertisements and contracts actually contain in the way of a penalty clause" before commenting.

Federal automotive tax receipts top $2 billion

Federal automotive excise tax returns set a record in 1952 by topping the $2-billion mark, according to the Bureau of Internal Revenue. Gasoline tax revenue alone totaled $851.5 million, or more than the total federal automotive excise receipts for any year prior to 1946.

Tax receipts, by sources, were:

	million
Gasoline	$851.5
Diesel fuel	14.6
Lubricating oil	92.2
Autos and motorcycles	601.8
Truck, buses & trailers	187.8
Tires and tubes	164.5
Parts and accessories	187.3

Many new design practices considered at ACI sessions

American Concrete Institute's annual convention at Boston approves new and revised standards

Thin-shell precast concrete, limit design, and vibration practices were among the topics rating major attention during the 49th annual convention of the American Concrete Institute in Boston last week.

The convention approved revisions of its standard requirements for precast-concrete floor units, updating of its "Manual of Concrete Inspection," and publication of a proposed "Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures."

Development of a recommended practice for prestressed concrete moved a step closer to realization as discussion of the proposed recommendations entered its final stage. But completion of this job appeared several years away.

• New officers—The ACI elected Henry L. Kennedy, manager of the cement division of Dewey & Almy Chemical Co., Cambridge, Mass., as president, and Charles S. Whitney, Milwaukee consulting engineer, as vice-president.

Chosen as new directors were: Federico Barona de Lao, head of the technical department of materials, Hydraulic Resources Ministry, Mexico City; Arthur P. Clark, research associate, American Iron and Steel Institute, Washington, D. C.; Jay E. Jellick, manager of the Portland Cement Association information bureau, San Francisco; and Vernon P. Jensen, staff consultant of C. F. Ruan & Co. Alhambra, Calif.

Franklin R. McMillan, Asheville, N. C. consulting engineer, received the Alfred E. Lindau Award for his contributions to reinforced concrete design. The Construction Practice Award went to F. Thomas Collins, consulting engineer of San Gabriel, Calif. for "resourcefulness in translating design into completed structure." Charles H. Scholer and Gerald M. Smith of Kansas State College, Manhattan, Kan. were given the Leonard C. Wason medal for noteworthy research. The Wason Medal for the most meritorious paper was awarded to Charles S. Whitney and Boyd G. Anderson of Ammann & Whitney and Prof. Mario G. Salvadori of Columbia University.

• Precasting standard changed—The convention's approval of revision to "Minimum Standard Requirements for Precast Concrete Floor Units" (ACI 711-46) changes the 1946 standard by adding descriptions of certain types of floor units. These include assembled concrete blocks, precast inverted T-joints with precast filler blocks, and precast slabs and inverted T-joists. Also, new information is added on bar spacing, steel requirements, distance between lateral supports and provisions for tests. The complete text was published in the ACI Journal, Nov. 1952, p. 169.

• Panels cast in plastic forms—A full technical session, under the chairmanship of A. Amirikian, was devoted to presentation of precasting techniques in use on current large-size building projects. In all cases, the size of the job permitted contractors to employ mass-production methods for thin-shell precast floor and roof units.

One contractor, the Trepte Construction Co., San Diego, Calif., used plastic forms for the interior of 4x24-ft panels and hinged steel forms for the outer faces. The basic unit was 4x4-ft plastic pan containing two ounces of glass-fiber mat and one layer of glass-fiber cloth per square foot. Six such units placed end to end formed one panel.

As erected in a hangar at the Naval Air Station, Miramar, Calif., the top slab was about one and a half inches thick and reinforced with 2x2 in. No. 10 welded wire mesh. Side joists were 10 in. deep and transverse ribs were spaced 4 ft apart. Advantages of the plastic pans, reported by Montgomery, the contractor's project manager, and Cmdr. T. G. Atkinson, resident officer in charge of construction, include light weight, durability and elasticity, which makes form stripping easy.

• Progress in limit design—Several equations for use in limit design were proposed by Prof. Howard Simpson of Massachusetts Institute of Technology, Cambridge, Mass. The ratio of steel area to concrete area beyond which a beam will fail in compression, as given by these equations, takes into account the variability of control of concrete strength in the field.

Another intriguing theory for limit design was advanced by Prof. Eivind Hognestad of the University of Illinois, Urbana, Ill. As developed primarily by Prof. K. W. Johansen of the Danish Institute of Technology, Copenhagen, this theory is useful for predicting the ultimate flexural strength of reinforced-concrete slabs. It is based on the assumption that if a slab is overloaded, yielding will begin in regions of high moment, and, as loading continues, yield lines will form and spread.

The load-carrying capacity of a slab will be exhausted when the yield lines reach the slab edges. In design, a yield pattern is assumed in accordance with support conditions and moments are computed for each portion of the slab at the yield lines. These moments indicate whether the assumed pattern is correct and, if not, how it should be changed.

This so-called yield-line theory has the advantage that only algebra is required for a solution.

• Vibration is good but—Current vibration practices were analyzed in another session, in which both words of praise and warning were uttered. Praise came from L. H. Tuthill, concrete engineer of the Bureau of Reclamation, Denver, Colo. "Modern vibration equipment," he said, "had revolutionized our concepts of mass concrete and as greatly extended the limits of economy that can be obtained without loss of quality."

The warning was issued by W. O. Crawley, materials engineer, concrete research division, Waterways Experiment Station, Jackson, Miss. Air content of mass concrete can be seriously affected by improper use of either a high frequency (13,000 cpm) or a moderate frequency (6,800 cpm) vibrator. Severe coarse aggregate segregation and uneven air distribution and loss can occur when the vibration period is as long as 90 seconds, if the vibrator is held in the same position.

On the cover . . .

Henry L. Kennedy, newly elected president of the American Concrete Institute, is a specialist in reinforced concrete design and construction.

A consulting engineer for 17 years, Kennedy was for 10 years head of the construction course of Wentworth Institute, Boston. In 1947, he headed a course in cement and concrete technology for the Harvard Graduate School of Engineering. A graduate of Wentworth and Northeastern University, Kennedy also studied at Beaune University in France.

A member of ACI since 1934, he has served on the Institute Board of Direction since 1944 and is chairman of its advertising committee.

Civil engineer grads far short of demand

Engineers' Joint Council survey indicates decreasing college turnout up to '55; recruiting drive proposed

Civil engineer graduates from the nation's 198 engineering schools with accredited curricula—and some non-accredited schools—will again fall far short of employers' needs, a preliminary survey by the Engineers' Joint Council indicated this week.

EJC officials said indications are that there will be a total of only 17,200 graduates available for private employment when June graduations are over—as against an estimated demand for about 30,000 young civil engineers. The figure takes into account the fact that about 6,100 of the graduating engineers will go directly into the armed services.

The estimate is a preliminary one, based on spot checks. A full-dress survey of the situation will start officially early in April.

EJC figures indicate a steadily decreasing number of graduates available for employment until at least 1955.

• **The facts**—EJC's manpower committee has kept a steady check on the engineering schools since shortly after World War II, checking enrollments and graduations each year, as well as making surveys of industry demands for new personnel. It applies an attrition factor (normally near 50%) to enrollments in freshman classes, in order to project future graduating classes.

Starting with 1952, the figures look like this:

	Graduates			To	
	Accredited	Non-accredited	Total	Service	Balance
1952	27,000	3,000	30,000	6,100	23,900
1953	22,500	1,500	24,000	6,800	17,200
1954	17,000	2,000	19,000	7,800	11,200
1955	20,000	2,000	22,000	12,000	10,000
1956	27,000	3,000	29,000	12,400	16,600

(Night schools, correspondence courses and the like are included as "non accredited")

• **The reasons**—Most educators and many informed observers are inclined to put a major portion of the blame for falling enrollments on an ill-advised announcement in 1950 by the Bureau of Labor Statistics.

BLS at that time circularized high schools nation-wide with information to the effect that civil engineers in particular would be hard put to find jobs in the future. Protest by most engineering societies and other groups forced the withdrawal of the misleading information—but the damage apparently had been done.

In addition there are three other factors: The steadily increasing drain to the armed forces; the fact that many civil engineering graduates do not enter the field, because their training in logic makes them excellent potential executive material; and—at least until recently—lower starting pay scales.

• **The results**—One result of the shortage has been a steady increase in starting pay scales, in private employment—and a consequent greater difficulty in obtaining qualified men by public agencies.

Starting pay scales for engineering school graduates in 1952 were rated at between $325 and $350 per month—considerably higher than they have ever been listed.

Thus, state and municipal agencies are finding it increasingly difficult to fill their needs—engineering jobs in the state highway departments have been going begging, as in North Carolina (ENR Feb. 12, p. 48), where a $200-million state highway program reportedly is bogging down for lack of engineering personnel.

• **Remedy?**—One possible answer has been advanced by the Advertising Council (ENR Jan. 29, p. 25) which has worked up a two-pronged campaign aimed at parents and at employers of engineers.

The campaign would aim at convincing parents, employers and students that there is a definite future in the profession—a future of well-paid opportunities, as well as of service to the community and nation.

Pennsylvania committee's rejection of Incodel stirs demand for probe

The special fact-finding commission which recommended that Pennsylvania reject the Incodel plan came under bitter attack in the state legislature last week, with a demand that its findings undergo investigation.

In a report to Gov. John S. Fine, the advisory group had suggested development of water resources wholly within the state plus possibility of an arrangement with New Jersey in preference to participation in the proposed four-state (N. Y., N. J., Pa. and Del.) compact for construction of Delaware River basin projects (ENR Feb 19, p. 48).

The good faith of the report was challenged by State Sen. Joseph J. Yosko, Bethlehem Democrat, primarily because of one of the recommendations dealing with possible development of the Lehigh River basin.

Yosko charged that the Lehigh Coal & Navigation Co. stands to realize $300 million through the sale of land if this proposal is adopted. "I want to know if there was any collusion in the preparation of the committee's report," Yosko told the Senate. "I know that William A. Schnader, counsel for the governor's committee, also is counsel for Lehigh Coal and Navigation Co. I know that one of the engineering firms employed by the committee in its study of the Incodel plan also is employed by the company."

Hammering further on the theme, Yosko declared, "I want to know whether there was any advance information given anyone before the report was released because Lehigh Coal and Navigation Co. stock jumped three or four points a few days before it was made public." He added that "under the committee's plan to develop a Pennsylvania water supply system, property rights of the company would be purchased to the tune of $300 million."

The Yosko resolution, which was referred to the state government committee, calls for public hearings and release of the engineering study on which the governor's fact-finding commission based its report.

Meantime, the advisory commission's findings, which Governor Fine has said he would endorse, have caused disappointment in New Jersey. Gov. Alfred E. Driscoll said it might become necessary for his state and New York "to go it alone" in tapping the Delaware River for additional water supplies (See editorial, page 88).

Officials of the four states involved in the proposed Incodel plan were to meet shortly in Philadelphia to discuss what action to take in the light of Pennsylvania's likely rejection of the program.

Rebuilding at Wake

Structures designed for hurricane resistance will be erected by the Civil Aeronautics Administration on Wake Island to replace those damaged in last September's typhoon. Housing will be built of cement block manufactured at Wake from local beach sand and coral and imported cement.

Interior takes closer look at problems

Civil functions switch to Reclamation, Hells Canyon, power deals are among hot potatoes handed to McKay

Proposed consolidation of federal civil works construction under the Interior Department is already getting attention from the new administration.

This, along with two other high policy matters demanding quick action, puts Interior Secretary Douglas McKay under pressure before he can grasp the reins of his new job. The two other matters:

- Shall Interior continue to press for federal construction of the $357-million Hells Canyon Dam on the Snake River in Idaho?
- Shall Interior enter a modified power "wheeling" contract with Georgia Power Co. which would provide for transmission of power from Clark Hill Dam on the South Carolina-Georgia line?

Along with its other government reorganization plans, the administration has dusted off the Hoover Commission proposal to transfer the civil works functions of the Army Corps of Engineers to the Bureau of Reclamation. Word in Washington is that the consolidation plan will be sent to Congress in the near future.

• **Transfer civil works?**—McKay, long an admirer and supporter of the corps, is coming around to the belief that the bulk of the waterway projects can be handled better by a civilian agency. While reiterating his high regard for the corps officers with whom he has worked in the Pacific Northwest, McKay is of the opinion that the military engineers appear to be "getting too big for their britches."

But no matter how the new administration views the consolidation proposal, it still will have to run the congressional gauntlet. It is doubtful that the lawmakers, even with the prodding of the Republican administration, will forsake the corps.

Congress has long considered the corps as its personal construction agency. Occasionally it has approved corps projects which never won the approval of the White House. While there has been growing congressional criticism of the corps, there has been no hint that Congress would abolish its civil functions or transfer the corps to a civilian department.

• **Decision due**—On the Hells Canyon project, McKay's decision is required by April 13. On that date hearings begin before the Federal Power Commission on an alternate project which would be built by Idaho Power Co. Former Secretary Oscar L. Chapman vigorously opposed the Idaho power alternative, and intended to carry this opposition to the FPC hearings.

McKay said recently he had not made up his mind on the Hells Canyon project, but indicated his views would depend on the engineering and economic facts in the case. He wants to get down to the bedrock data—brushing away the public-private power controversy.

Accordingly he will have Reclamation Bureau specialists review the Hells Canyon plan during the next few weeks. Once his views are firm, he will decide whether to oppose the electric company proposal before FPC.

• **Power decision**—The transmission contract proposed by Georgia Power Co. was turned down by ex-Secretary Chapman a few days before he left office. It is now before McKay. Again because of the tedious and controversial public-private power issues involved, the contract is a political hot potato.

Under policies followed by the Democrats, electric energy generated at government projects was carried to designated customers either over government-built transmission lines, or over electric company lines for which the government paid wheeling charges. Priority customers such as public bodies and rural electric cooperatives became direct customers of the federal government, often at the expense of electric companies.

The proposed Georgia Power contract seeks a middle course. It would purchase power generated at Clark Hill Dam and transmit it over company lines to customers designated by the government. Thus the company would retain its customers, and the government's priority customers would also get a share of low-priced energy allotted to them.

Navy to build $12 million facilities at Oceana jet base; runways finished

Development of the Navy's master jet air base at Oceana, Va., one of four now under construction, will be furthered this year under building contracts amounting to $12 million.

This year's program provides chiefly for construction of operating facilities and housing. Runway construction costing $8.6 million has been completed under the initial phase of the program, for which $10.5 million was appropriated. Ultimate cost of the base is expected to run over $37 million.

The Oceana base, located near Virginia Beach, Va., is being built on the site of an auxiliary flying field used from 1943 to 1950. The field, which was re-opened in 1951, had two 6,000-ft runways, inadequate both lengthwise and structurally for jet aircraft.

The Navy lengthened the two existing runways to 8,000 ft and built two more runways of the same length. New runway construction was designed to withstand planes with single wheel loads up to 50,000 lbs on tire pressure up to 250 lbs per sq in.

The 2,000 ft added to the two existing runways was built of Portland cement concrete to give them an area of pavement impervious to the jets' heat and not subject to softening.

Two new parallel runways were built with 1,000 ft of reinforced-concrete at each end and bituminous material in their inner 6,000 ft stretches. Concrete slabs are 10 in. thick over 18 in. of compacted base. The bituminous portions were constructed on a 19-in. base, topped by six inches of penetration macadam and three inches of asphaltic concrete. The 6,000 ft of intermediate stretches were built of flexible pavement because of the critical shortage of cement and steel, and the considerable saving in costs.

Beyond the end of each runway 1,000 ft of open zone is provided. A concrete parking apron for 300 planes was put down and a number of taxi strips built along the runways.

Runway construction and auxiliary paving work was done by T. E. Ritter Corp. of Norfolk, Va., and the Bowe Contracting Co. of Augusta, Ga. Principal contractors on this year's phase of the project include the Virginia Engineering Corp. of Newport News, Va., for buildings, Bero Engineering and Contracting Co. of Hampton, Va., for roads and utilities and Regent Construction Co. of Washington, D. C., for barracks.

The Navy is acquiring 5,000 acres for the Oceana base, which is about four times the size of the old auxiliary airfield.

The four other major Navy jet bases under construction are located at Cecil Field, Fla., Brunswick, Me., Miramar, Calif. and near Seattle, Wash.

Report hits wage law enforcement, but issuing committee does not sign

Report says Davis-Bacon prevailing wage law is loosely enforced on federal construction

A controversial report criticizing alleged lax enforcement of the Davis-Bacon "prevailing wage" and other protective wage laws covering federal construction has been made public by the Senate Labor Committee.

The 105-page report is the result of a study ordered by the committee in the Democratic-controlled 82d Congress, but the committee failed to act on it or issue it before the Republican Congress came in last month. The report is now issued belatedly by the former committee chairman, Sen. James E. Murray (Mont.), as a "staff report" which does not commit any of the senators.

A month ago, it was said that the report would not be issued. The Labor-Management Relations sub committee would not issue it because there was no sworn testimony and the private contractors and federal agencies accused had not had a chance to defend themselves. Nor would individual senators, even Sen. Murray, put their signature to the report. The report was prepared by the old committee's economist, Alexander K. Christie, who made on-the-spot investigations and spent months in research and study.

• **Laxity cited**—In releasing the report, Sen. Murray said that the six case histories cited indicate laxity on the part of federal agencies which enables contractors who do not comply with federal wage regulations to underbid other contractors unfairly. The material contained in the report will be helpful, he said, "in drafting future remedial legislation."

The report is entitled "Labor-Management Relations in Federal Projects Involving the Davis-Bacon Act."

Targets are the Labor Department and agencies undertaking construction projects—Bureau of Reclamation, Army Corps of Engineers, U. S. Air Force and Navy Bureau of Yards and Docks. It accuses various contractors of failing to observe the wage and other labor standards required on federal works, but blames the agencies for failing to enforce the laws, through blacklisting and other means.

One federal official said that the Labor Department was, in reality, responsible for this condition because of one-sided interpretation of the laws in favor of labor unions, pushing up project costs as well as delaying completion.

• **Report's scope**—Projects covered by the report are:

• Construction of 115-kv transmission line, Fort Peck project, Mont.; Pensacola Naval Air Station; U. S. Air Force's Eglin Field, Fla.; Missouri River Basin project, Wyo.; Hungry Horse Dam and Bull Shoals Dam.

• Laws violated, the report charges, are the Davis-Bacon prevailing wage act, the eight-hour law, the false affidavit act and the Copeland (anti-kick-back) act.

• The report makes 14 recommendations, which no doubt will be studied by Secretary of Labor Martin P. Durkin, who has been a member of the AFL Building Trades executive council which has long complained about conditions covered in the report. To get anything done, however, he will have to convince President Eisenhower and other cabinet officers of the need. There is little chance of Congress doing anything.

• The report recommends that low bids be rejected where the contractor has "repeatedly violated" the law on other federal jobs; the Labor Department be given a staff of expert inspectors to check conditions on a job, also serve as a check on lax enforcement by the procurement agency.

NLRB upholds long pacts

For the first time the National Labor Relations Board has held that a collective bargaining contract may bar an election for a period of longer than three years.

The board said:

"We believe the time has arrived when stability of labor relations can better be served, without unreasonably restricting employees in their right to change representatives, by holding, as a bar, collective bargaining agreements even for five years' duration when, as here . . . a substantial part of the industry concerned is covered by contracts with a similar term."

The board's action upheld the contention of two employers in the auto industry and three unions that the contracts should operate as bars to elections for their full term.

All contracts involved in the four cases expire in 1955.

The decision changed the board's earlier rule that long-term contracts would be held to bar a representation election among employees only when it was proved that contracts of such duration were the "custom in the industry."

Construction firm fights North Carolina painters

The J. A. Jones Construction Co., last week filed suit in Durham County Superior Court at Durham, N. C., asking $22,100 damages from the Durham Painters Local 678, AFL, and several individuals for work stoppages and picketing on construction projects at Duke University, Durham, and the University of North Carolina, Chapel Hill.

The Jones firm said that it is engaged in the construction of a tuberculosis hospital and school of commerce building at the University of North Carolina and an administration building at Duke University, and that it has certain subcontracts to complete the projects but because of actions of the union has not been able to do so.

On Jan. 20, the law suit alleges, the union caused a picket line to be established at the Duke job, and as a result of the picketing, Jones' employees and subcontractors' employees left the job site, refusing to cross the picket line. Painters on the Chapel Hill projects did not return to work for two days, the suit charges.

Simultaneously, the suit states, a picket line was set up at Duke "as a part of a scheme and conspiracy to force the plaintiff to violate the state's right-to-work statute and break its contract with the painting subcontractor, D. C. May, of Durham."

On Jan. 23, the Jones firm obtained from the Superior Court a temporary restraining order prohibiting the picket line and preventing the union from interfering with the projects. Through intimidation and threats of fines by the union, the suit further alleges, carpenters who had returned to work on Jan. 26 left their jobs again and the jobs shutdown lasted through Jan. 29.

Strike ends at Savannah River H-plant

Conference in Washington irons out dispute enough to persuade men to return to work pending settlement

The three-day walkout of the construction trades at the Savannah River H-plant near Augusta, Ga., ended last week after a conference between the duPont Co. prime contractor, and the representatives of the AFL Building Trades Department in Washington, D. C.

The walkout started when 780 union painters struck Feb. 15 and set up a picket line which was honored by 27,000 employees belonging to other unions.

Stoppage stemmed from a wage dispute between AFL painters and duPont. They had agreed on a 12½-cent hourly increase for four classifications of painters—Brush, Amercoat, Spray and Sign—but union was insisting on 15 cents for steel painters. To back up this demand, painters picketed the project and, at the same time, enlarged their demand to include a $3-a-day travel allowance.

When the other 18 building trades crafts refused to cross the picket line, a meeting of the local AFL Building Trades Council was held and all the unions decided to ask for the $3 travel pay, too, assuming that the painters were picketing for the $3.

DuPont and painters union officials shifted their talks to Washington last Wednesday, where Joseph B. Keenan, secretary-treasurer of the AFL Building and Construction Trades Dept., joined in.

DuPont wired international officers of all the unions reminding them that, under 1951 agreements, there was to be no travel allowance on this project from beginning to completion. Union chiefs acknowledged that this was true. DuPont yielded to the 15-cent demand for steel painters and thus settled the wage dispute.

Keenan said it was agreed that the men would return to work and that issues in dispute would be negotiated while construction proceeds.

At last reports, construction had resumed at the plant.

SECRETARY KEENAN, of AFL Building Trades Dept., announced settlement.

Wage boosts requested in two Ohio localities

In two separate Ohio cities, building trades unions provided an early indication of what they will be asking during the spring contract-signing season.

In Cleveland four unions asked for a 25-cent-an-hour increase, and in Youngstown, 19 unions asked for 37 cents an hour more.

• **Cleveland**—The General Contractors' Association in Cleveland was notified recently by four AFL building crafts that they want a 25-cent-an-hour wage increase and an additional 7.5 cents-an-hour for health and welfare. Identity of the four crafts demanding the increases was not disclosed.

Announcement of the demands was made at a meeting of the joint policy committee of the contractors' group and the AFL Building Trades Council. The increases are above those which would have been allowable under wage controls thrown out three weeks ago.

Spokesmen for the employers' group said there can be no increase in the immediate future. They cited as the reason for the denial a slackening of business in the building industry.

The union said the wage increase was not a formal demand.

The Building Trades Council has jurisdiction over more than 40,000 construction workers in the Greater Cleveland area.

• **Youngstown**—Nineteen crafts of the Youngstown Building Trades Council have submitted demands for a 37-cent-an-hour wage increase, seven paid holidays and a paid vacation plan, William Thomas, council president, announced recently.

The demands were presented by letter to members of the Builders Association of the Mahoning Valley, and contract negotiations within a 16-member labor-management committee already are under way. Most current wage contracts expire April 30.

Thomas said the vacation plan proposed this year would involve payments by contractors into a general vacation fund.

Thomas added that the recent lifting of wage controls has had no effect on size of the demands. New contract proposals were set out before the Presidential order ending controls was issued, he said.

Labor briefs . . .

• **Taft favors AFL men**—A trial attorney for the AFL carpenters—former Republican Congressman Harry N. Routzohn of Dayton, Ohio—is in line to be the new solicitor of the Department of Labor. Routzohn was recommended by Sen. Robert A. Taft.

As a one-term congressman, Routzohn was a member of the Smith Committee that investigated Communist influences in the National Labor Relations Board in 1940.

• **NLRB change proposed**—An increase in the membership of the National Labor Relations Board from five to nine members was proposed last week by Rep. Kearns of Pennsylvania in hearings before the House Labor Committee.

Kearns' proposal is similar to the amendment proposed by Senator Taft, who favors an increase to seven members. The Taft amendment would be on a party basis with four members from the same political party. Kearns made no provision for political division and under his proposal any three members would be authorized to dispose of cases.

• **Taft-Hartley committee**—Labor Secretary Martin P. Durkin last week named a 15-member advisory committee to help draft proposals for changing the Taft-Hartley Law.

Construction people named included: John J. O'Donnell, president of the National Construction Association named as an industry representative; and labor member George Meany, president of the AFL.

REPRESENTATIVE CONSTRUCTION COST AND UNIT WATER COST DATA 13 TO 14-MGD INDUSTRIAL WATER SUPPLIES

					Construction Cost $1,000					Annual Fixed Costs				Annual Operating Costs			Unit Costs Per mg		
#	State	Source of Water	Reservoir acre-ft.	Pipe-Line Miles	Storage Res.	Pump Sta. & Pipe Line	Storage Basin & Filters	Total	Total Per MGD	Taxes & Insur. @ 1%	Interest @ 5%	Deprec.	Total	Power	Labor, Filtration Etc.	Total	Fixed	Operating	Total
1	Pa.	Ten Mile Cr.	10,400	6.5	2,846	1,107	650	4,603	354	46,030	230,000	122,800	398,830	20,060	44,200	64,260	84	14	98
2	Md.	Savage R.	11,100	5.0	4,440	1,038	650	6,128	471	61,280	306,000	162,700	529,980	56,900	50,600	107,500	110	23	133
3	W. Va.	Kenawha R.	——	8.5	——	1,543	650	2,193	169	21,930	110,000	64,400	196,330	54,000	44,200	98,200	41	21	62
4	Mo.	Chariton R.	13,550	0.25	3,050	100	650	3,800	292	38,000	190,000	101,500	329,500	9,500	44,200	53,700	69	11	80
5	Ill.	Otter Cr.	20,000	18	3,600	2,580	650	6,830	525	68,300	341,500	180,200	590,000	71,000	44,000	115,000	124	24	148
6	Ky.	Ohio R.	——	2	——	411	650	1,061	82	10,610	53,000	33,600	97,210	19,800	44,200	64,000	20	14	34
7	Ill.	Ohio R.	——	23	——	3,220	650	3,870	298	38,700	193,500	105,800	338,000	66,000	44,000	110,000	71	23	94
8	Wyo.	CrazyWomanCr.	12,000	24	1,500	3,900	765	6,430	467	64,300	321,500	180,290	566,090	101,610	53,770	155,380	113	31	144
9	Mont.	Yellowstone R.	——	2	——	555	815	1,368	99	13,680	68,400	44,220	126,300	40,900	47,770	88,670	25	18	43
10	Colo.	Colorado R.	——	8	——	1,940	765	2,705	197	27,050	135,250	79,080	241,380	72,500	47,770	120,270	48	24	72
11	Wyom.	Green R.	——	42	——	6,690	765	7,455	541	74,550	372,750	204,090	651,390	170,700	47,770	218,470	130	44	174
12	N.M.	San Juan R.	2,300	3	875	645	765	2,285	166	22,850	114,250	67,390	204,490	43,600	47,770	91,370	41	18	59

This kind of detailed estimate of water costs was made for . . .

How much does industrial water supply cost?

Richard Hazen
Hazen and Sawyer, Engineers
New York, N. Y.

A TWO-YEAR, nationwide survey of the synthetic liquid fuel potential of the U. S. and Alaska was completed for the Bureau of Mines in 1952. Relative costs of producing liquid fuel from coal, oil-shale and natural gas in various parts of the country were figured, including costs of power, transportation, labor, housing—and water.

Cost figures brought out include, among others: $250-300 per acre-ft for small reservoirs; $175-250 for large; $120,000 per mile for pipeline; $450,000 for a filter plant to treat 5-mgd peak flows.

Altogether, 233 general areas in 25 states and Alaska were considered (see map). Except for a few areas using oil shale or gas, the probable cost of water was figured for each on this basis:

- **Type of plant**—coal-synthine
- **Water required**—13 to 14 mgd, about one-third of it filtered for process needs and domestic demand
- **Location**—usually near the center of raw material deposits and within reach of a railroad. (In all but 21 general areas considered, water was within reasonable distance.)
- **Sources**—surface supplies except in Texas and Louisiana where combined ground and surface water supplies were considered.

These were the general considerations; and outlined below are the specifics upon which the accompanying, charted cost probabilities are based.

While it has been convenient to refer to synthetic liquid fuel plants in the text, the data are applicable to other industrial developments requiring comparable quantities of water.

- **Water storage**—Except in Texas and Louisiana, where ground water supplies or combined ground and surface water supplies might be used, all estimates were based upon surface water supplies. In some areas, particularly those along the larger rivers, adequate ground water supplies might be available. However, there was no opportunity to prove the availability of such supplies, thus the other types of development was used for the estimates.

For areas requiring water supplies of 13 to 14 mgd, the cost estimates were based upon a water supply system usually including the following:

An impounding reservoir was figured to supplement dry weather flows, except where water could be taken from major streams.

In the Appalachian Mountain region the capacity of the storage reservoirs ranged from 7,000 to 24,000 acre-ft with a median near 12,000 acre-ft. In the Midwestern region the storage required was somewhat greater, ranging from 15,000 to 26,000 acre-ft. In the upper Missouri River Valley and the Rocky Mountain region, the best reservoir sites have been considered for power, irrigation and flood control projects, and reservoirs much larger than those required for synthetic liquid fuel plants are likely to be built.

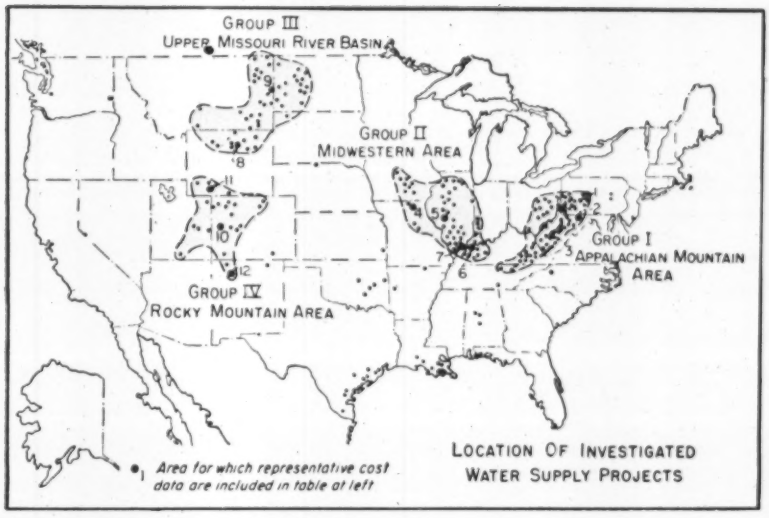
In these areas it was generally assumed that water would be purchased from existing or proposed reservoirs at rates comparable to those now charged in irrigation and power developments. In some cases, an appropriate part of the cost of the large reservoir was assigned to the synthetic fuel plant.

Storage required for supplies of 14 mgd in the western states ranged from 6,000 to 25,000 acre-ft, depending frequently upon the extra capacity to be provided for silt deposition. In the Rocky Mountain states storage reservoirs to maintain a given draft normally are relatively larger than in the eastern states; however, in this study the western rivers considered are larger than the considered streams in the east, so the reservoirs would be of comparable size.

Reservoir costs on the Western rivers generally were estimated on the basis of known or estimated costs for existing projects. In the Midwestern and Eastern regions, where applicable reservoir studies usually were not available, suitable unit costs per acre-ft of storage were used.

Unit cost for storage is much higher for a small reservoir than a large one. For example, a 10,000-acre-ft reservoir might cost $250 to $300 per acre-ft; a 20,000-acre-ft reservoir would cost between $175 and $250 per acre-ft. Unit costs used were all-inclusive, covering the purchase of land, construction of dam and spillway, relocation of highways and unusual expenses, such as the relocation of railroads or small villages.

- **Pumping stations**—A raw water pumping station was included. It had 3 pumps (any two of which could deliver 14 mgd) and standby engine



these 233 potential industrial sites

drives for two units. Pumping heads ranged from 100 to 300 ft, with a few much higher lifts. Cost of pumping stations was $80,000 to $240,000.

• **Transmission**—Pipelines from sources of supply to the plant sites were estimated as 30-in. pipe in most cases costing $120,000 per mile. For some sites pipelines were 30 to 40 mi long.

In the Appalachian Mountains the choice of source of supply was governed largely by the length of pipeline required. Frequently it was necessary to compare the cost of a long pipeline to a larger river with the cost of a short pipeline and an impounding reservoir on a closer, smaller stream.

A raw water storage basin at the plant site, holding one day's supply or 14-mg, was estimated to cost $200,000. In some instances where the impounding reservoir was adjacent to the plant this storage was omitted.

• **Treatment works**—Filter plant, a filtered water storage reservoir and pumping station with capacities to meet peak demands up to 5 mgd were figured to cost $450,000. In some areas in the West, allowances were made for extra settling facilities to reduce turbidity.

All costs were based upon first-class construction designed to operate efficiently with low maintenance costs for a period of 30 or 40 years. For many industrial water supplies, less expensive works might be built, but the cost of reservoirs and long pipelines often cannot be reduced substantially even for relatively short-lived projects. Furthermore, the cost of the water system was so small in relation to the overall operating costs of a synthetic liquid fuel plant that it was desirable to be conservative in providing ample reserve capacity and standby units to reduce production stoppages.

All construction costs include 20% for engineering and contingencies. They were estimated during 1949-51 when the ENGINEERING NEWS-RECORD construction cost index was approximately 480. (Today, it is 587.)

• **Estimate limitations**—It must be recognized that the use of fairly uniform unit costs for all of the projects within a given region makes the cost data suitable only for indicating the probable cost range within an area.

The estimated unit cost of water presented here includes fixed charges of 5% of the capital cost for interest, 1% of the capital cost for taxes, and straight line depreciation allowances calculated on a 40-year life for the principal structures and a 20-year life for machinery and equipment. (In the reports submitted to the Bureau of Mines, interest was not included because there could be no agreement on the proper rate of return to be applied.) Operating costs include supervision and labor; electric power for pumping, chemicals for water treatment, and general maintenance. For most areas, the operating cost for filtration plants was estimated between $15 and $18 per mg, depending upon the raw water characteristics. Power generally was estimated at 6 to 10 mils per kwh. Usually it was assumed that power for pumping would be generated at the synthetic liquid fuel plant. However, after allowing for power transmission losses, the cost per kwh at the pumping station frequently was comparable with the local commercial rate for large blocks of power.

Representative construction costs and unit water costs are summarized in the table. The data are intended to show the normal range of costs; extremely high and extremely low values have not been included.

• **Probable costs**—Construction cost and unit water cost data for the plant sites shown on the map have been plotted in order of magnitude on the accompanying graphs. The data are plotted on arithmetic-probability paper; this plotting gives reasonably straight lines. Within limits the data follow the normal law of probabilities, but there are obviously fixed minimum costs, and a few plants have unusually high costs because of special construction difficulties or extra-long pipe lines.

The lowest costs reflect conditions where a very short pipeline and low-lift pumping would be required. The highest costs reflect conditions where storage reservoirs and long pipe lines would be necessary. The data have been divided into those projects requiring storage reservoirs and those for which no storage would be needed, because the cost of reservoirs is relatively large in relation to the total cost of most projects. The numbered points on the graphs refer to the particular sites listed in the table.

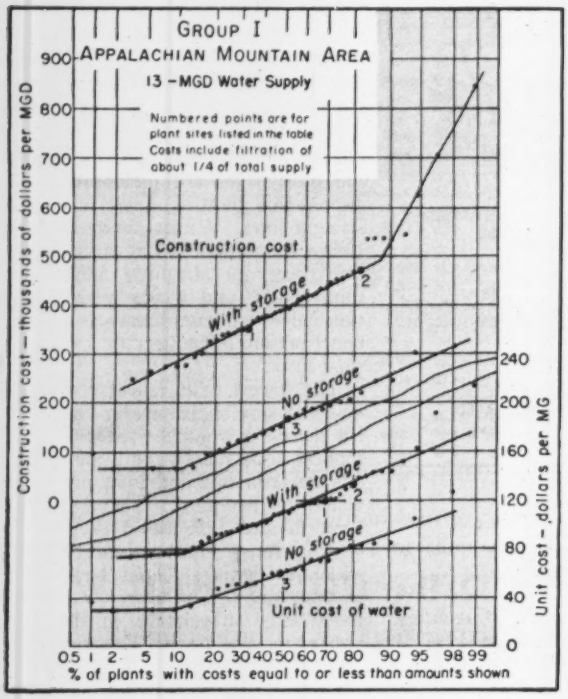
Application of the graphs may be illustrated by reference to the data for the Appalachian Mountain region (first graph). The bottom ordinate shows the percentage of plant sites with costs equal to or less than the amounts shown. Thus, for example, the construction cost of the water systems with storage for 80% of the areas was $475,000 per mgd capacity or less. Similarly, the cost of 80% of the no-storage projects was $225,000 per mgd, or less. Comparable unit water costs, including fixed charges and operating costs, were $132 and $80 per mg, respectively.

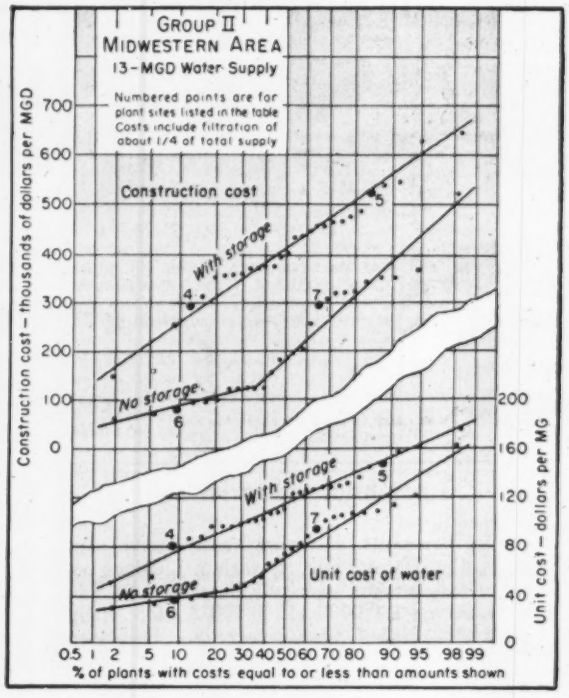
Based on these studies, there are eight chances in ten that a water supply of the type described could be obtained in the Appalachian Mountain region for these costs or less. The costs can be read directly for any other selected percentile, and the median costs for each group are indicated by the 50 percentile.

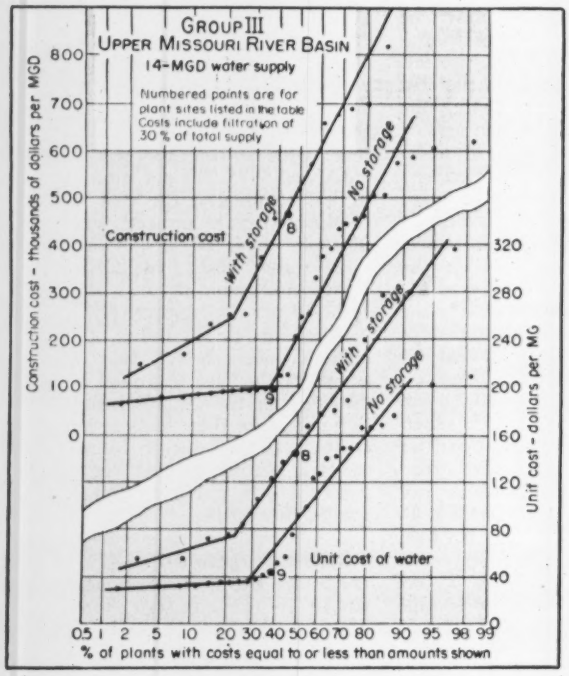
• **Regional peculiarities**—The cost curves for the midwestern region are similar to those in the Appalachian Mountain region. In the upper Missouri River basin the curves are steeper, indicating greater variation.

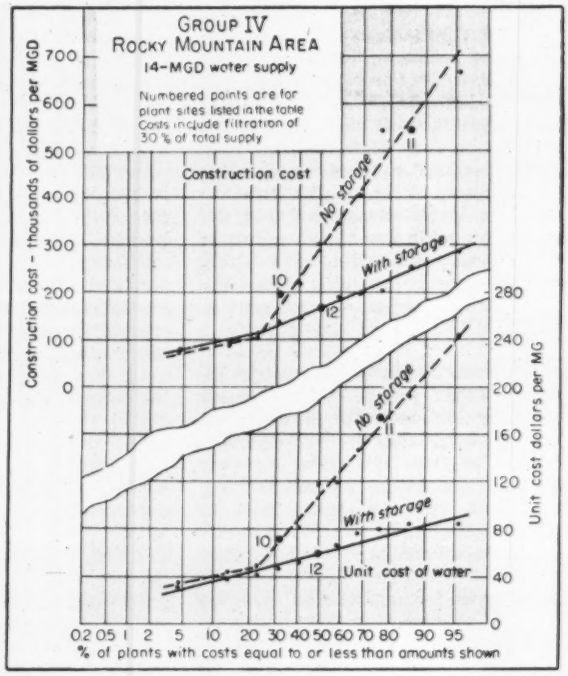
In the Rocky Mountain region a peculiar situation develops in that the costs for no-storage projects are greater than the cost with storage reservoirs. The location of several of the plant sites in these states is such that the only water supply available would be one of the larger rivers many miles

Probable construction costs and unit water costs evolved


GROUP I
APPALACHIAN MOUNTAIN AREA
13-MGD Water Supply
Numbered points are for plant sites listed in the table
Costs include filtration of about 1/4 of total supply
Construction cost
With storage
No storage
With storage
No storage
Unit cost of water
Construction cost – thousands of dollars per MGD
Unit cost – dollars per MG
% of plants with costs equal to or less than amounts shown


GROUP II
MIDWESTERN AREA
13-MGD Water Supply
Numbered points are for plant sites listed in the table
Costs include filtration of about 1/4 of total supply
Construction cost
With storage
No storage
With storage
No storage
Unit cost of water
Construction cost – thousands of dollars per MGD
Unit cost – dollars per MG
% of plants with costs equal to or less than amounts shown

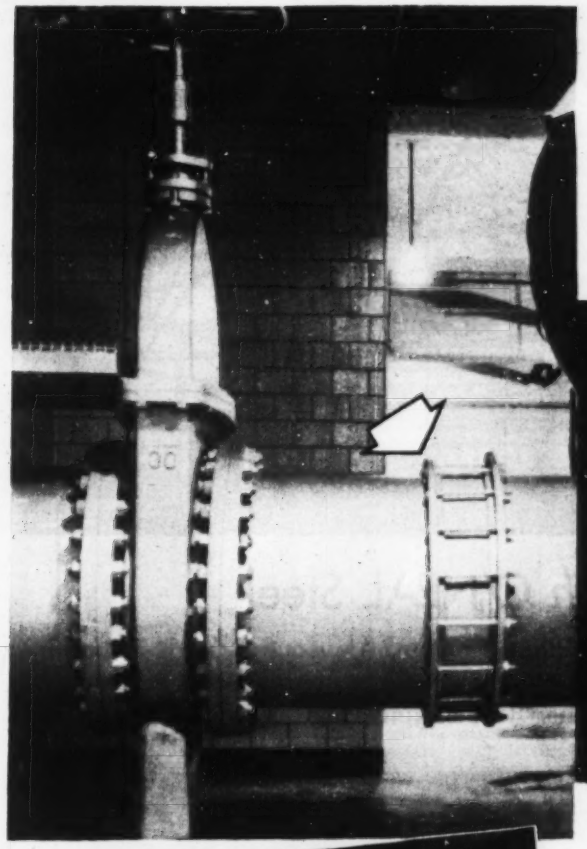

GROUP III
UPPER MISSOURI RIVER BASIN
14-MGD water supply
Numbered points are for plant sites listed in the table
Costs include filtration of 30 % of total supply
Construction cost
With storage
No storage
With storage
No storage
Unit cost of water
Construction cost – thousands of dollars per MGD
Unit cost – dollars per MG
% of plants with costs equal to or less than amounts shown

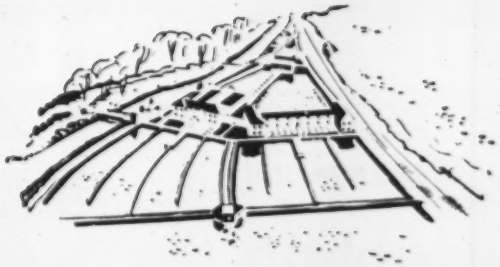

GROUP IV
ROCKY MOUNTAIN AREA
14-MGD water supply
Numbered points are for plant sites listed in the table
Costs include filtration of 30 % of total supply
Construction cost
No storage
With storage
No storage
With storage
Unit cost of water
Construction cost – thousands of dollars per MGD
Unit cost dollars per MG
% of plants with costs equal to or less than amounts shown

away, with the pipeline and pumping relatively expensive. Furthermore, in several instances the anticipated use of existing or proposed large multi-purpose reservoirs resulted in relatively low storage costs.

It will be noted that for the Appalachian Mountain and midwestern region the lowest construction costs with reservoir are comparable to the highest costs without reservoir. In the figure showing costs for Groups I and II (p. 35), the construction costs have been combined into a single series arranged in order of magnitude. These curves indicate the probable range of cost, without regard to the inclusion or exclusion of a reservoir.

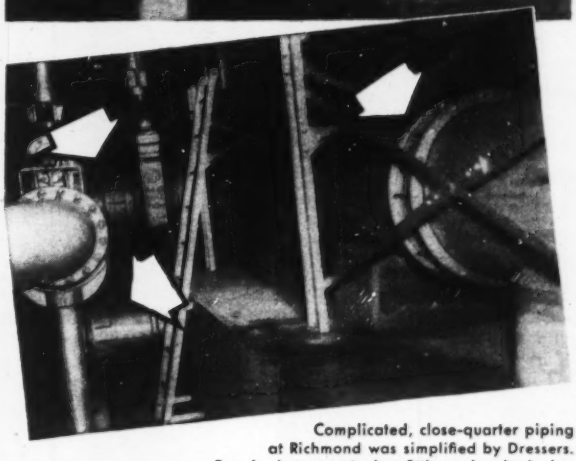
From the manner in which the estimates were made, it is obvious that the cost of water will be roughly pro-





at Richmond, Virginia...

DRESSER COUPLINGS *Safeguard Big Valves*



Complicated, close-quarter piping at Richmond was simplified by Dressers. Required no exact pipe fitting, absorbed pipe movement without leakage.

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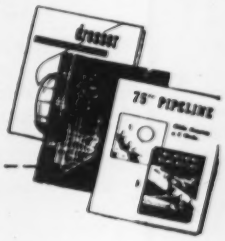

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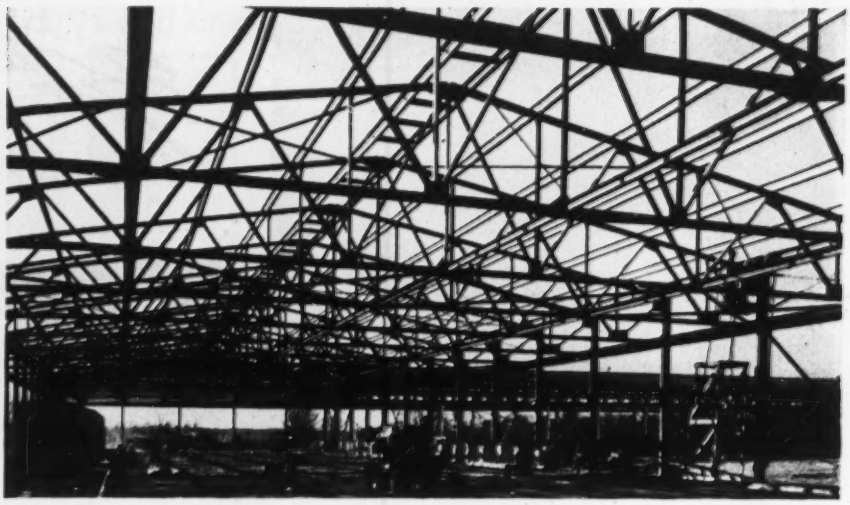
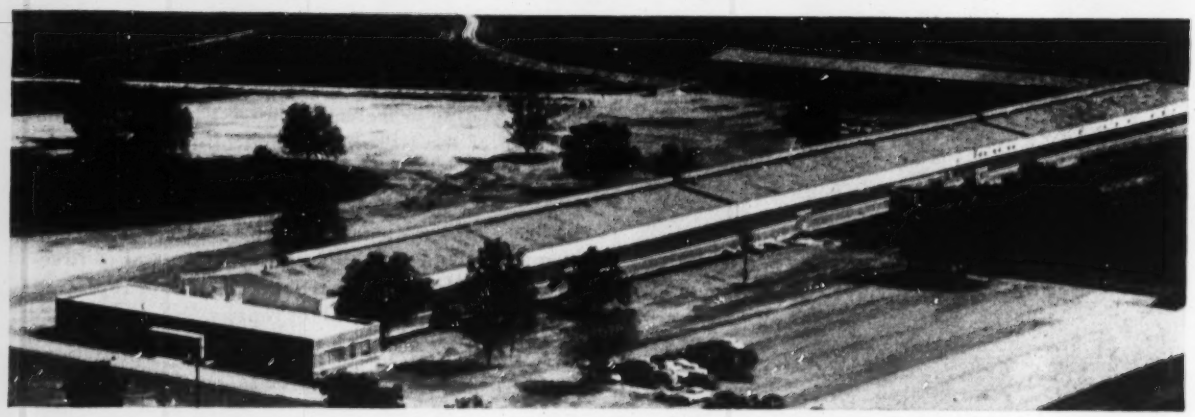
Westinghouse

Lighting the Way SOUTH



Off to a good START *with* O'NEAL Steel

Westinghouse Lamp Plant, Reform, Alabama. Length of building, 767 feet. Floor area, 62,894 sq. ft. Structural steel fabricated by O'NEAL, over 650 tons. Rust Engineering Co., general contractors.



Finished on schedule—*with room to spare*

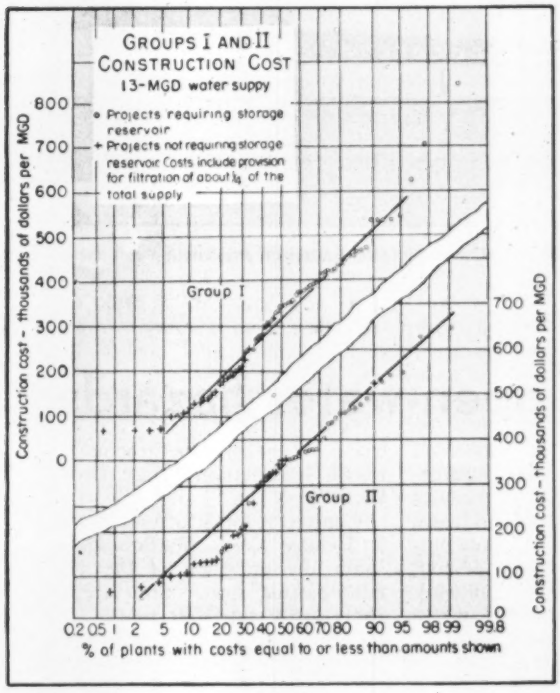
This extensive lamp plant for Westinghouse is typical of the industrial construction going up all over the South—long, low, flat buildings. The South has room for such buildings: room to breathe, room to work, room to grow.

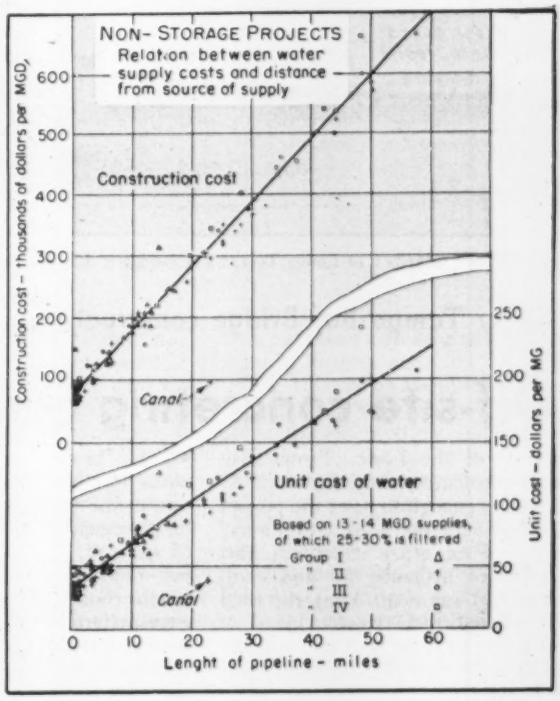
The intricate details of this structure, together with its great size, presented the sort of problem for which the O'NEAL plant is well fitted. Structural steel was erected on schedule. O'NEAL is proud of its part in helping Westinghouse, and many other major industrial concerns, expand in the South.

O'NEAL STEEL WORKS

BIRMINGHAM, 2, ALABAMA

Pictures of effects on cost of storage and pipeline lengths took shape


GROUPS I AND II
CONSTRUCTION COST
13-MGD water suppy
o Projects requiring storage reservoir
+ Projects not requiring storage reservoir Costs include provison for filtration of about ⅓ of the total supply
Group I
Group II
Construction cost - thousands of dollars per MGD
Construction cost - thousands of dollars per MGD
0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8
% of plants with costs equal to or less than amounts shown


NON-STORAGE PROJECTS
Relation between water supply costs and distance from source of supply
Construction cost
Canal
Unit cost of water
Based on 13-14 MGD supplies, of which 25-30% is filtered
Group I Δ
II +
III o
IV □
Canal
Construction cost - thousands of dollars per MGD
Unit cost - dollars per MG
Lenght of pipeline - miles

portional to the distance from the source of supply. The final chart shows the construction costs and unit costs of water for the non-storage projects plotted against the length of pipeline required. The only point that falls badly out of line is that for a project in Indiana, where it was expected that an existing canal would be used to deliver the water over much of the distance. Where storage reservoirs are involved, the cost figures scatter over a wide range when plotted against the length of pipeline.

The water costs for synthetic liquid fuel plants using coal in isolated areas, outside the four principal regions noted, are comparable.

Two sites were considered in Alaska for the production of synthetic liquid fuel from coal. The water costs in Alaska were several times those estimated in the U. S., not only because of the difficulty of construction in cold weather, but also because of high labor, freight and power rates.

For the 10,000-bbl-per-day oil-shale plant in Utah, requiring 1.8 mgd and a 3,000-acre-ft storage reservoir, the water supply construction cost was estimated at $350,000 per mgd capacity, and the unit water cost at $120 per mg. For a similar plant in Colorado taking water from the Colorado River without storage, the comparable figures were $380,000 per mgd capacity and $180 per mg.

In five of the potential synthetic liquid fuel plant areas in Texas, where natural gas would be used, the cost estimates were based upon 4.8-mgd well water supplies for both industrial and domestic purposes. The estimated construction cost ranged from about $100,000 to $200,000 per mgd capacity. The unit fixed and operating costs ranged from $40 to $70 per mg. In three areas where a combination river and well water supply might be used, the construction and unit water costs were slightly higher. It was anticipated that sea water would be used in one area for cooling and that fresh water industrial needs would be obtained by distillation.

In spite of the smaller water quantities, the unit costs in Texas were lower than elsewhere in the U. S. This was due to the fact that it is cheaper to transport gas than water, so plant sites were selected near available sources of water supply. Plant sites in Louisiana were selected near large bodies of water where once-through cooling would be possible. The pumping rate would exceed 60 mgd, and the cost data are not applicable to this analysis.

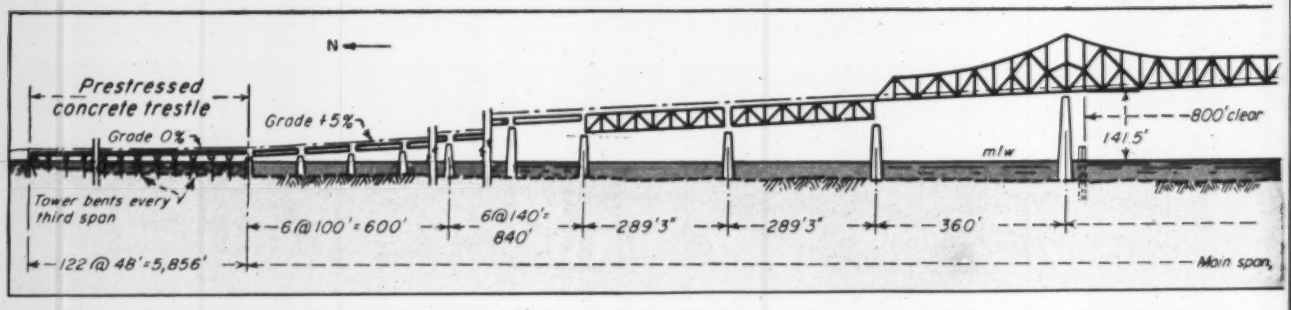
• **Use of these data**—Most of these cost data pertain to relatively large water supplies, 13 to 14 mgd. Some of the data can be used as a general guide to the probable costs of smaller or larger supplies, but only with caution. In many parts of the country, where the synthetic liquid fuel studies indicated storage reservoirs would be needed, smaller supplies of 3 to 5 mgd. could be developed without storage reservoirs.

The data can be used reasonably well over a range of perhaps 10 to 16 mgd. Beyond these limits they are likely to be misleading.

As noted previously, the overall cost data include the cost of filtering about one-third of the total supply. If filtration were eliminated, the total construction cost would be reduced by approximately $450,000. (This is equal to $32,000 per mg if distributed over the entire 13 or 14 mgd supply.) Fixed and operating costs for the 14 mgd supply would be reduced approximately $155 per day and thus reduce the overall unit cost $11 per mg.

The survey of the synthetic liquid fuel potential of the U.S. was made for the Bureau of Mines, under a contract with the Corps of Engineers, by Ford, Bacon and Davis, Inc., of New York, and a group of consultants, each assigned to specific parts of the work.

Water supply and liquid waste disposal investigations were carried out by Malcolm Pirnie Engineers, New York, with the writer serving as partner in charge. R. J. Tipton and Associates, Inc., Denver, Colo., assisted in preparing the water supply reports and estimates for the Rocky Mountain area and Upper Missouri River Basin.



LONGEST ELEMENT of Lower Tampa Bay Bridge is 4.2-mile Structure C. Current interest centers on construction of prestressed stringers

Lower Tampa Bay Bridge construction:

Off-site concreting cuts open-water hazards

Just one of the Lower Tampa Bay Bridge elements—4.2-mi Structure C—would be enough to place the project in a class with the longest over-water bridges. Four other structures, plus stretches of hydraulic fill and hard-ground highway work, bring the total project length to 15.1 mi.

When it is completed in 1954, the project will close the last important gap in the Gulf Coast Highway, along Florida's west coast. Like 4.1-mi Chesapeake Bay Bridge and San Francisco Bay Bridge (4.3 mi of structure) as well as other long bridges of recent years, it will replace a ferry service that has caused vexing delays to motorists for many years.

At present, two contractors are doing as much of their superstructure concreting as possible in casting yards on shore, in order to avoid hazards of open-water construction. The eleven-mile width of shallow water between St. Petersburg and Manatee County made it possible to build hydraulic fill along substantial portions of the route, and to string out many thousands of feet of simple pile-bent-supported trestle.

More pretentious foundations are being built only at navigation channels. One of these is the Intra-Coastal Waterway channel, near St. Petersburg, which will be crossed by a double-leaf bascule. Bascule piers, now complete, are pile-supported, having been built in tremie-sealed open coffer-dams. Similar foundations, eleven of them resting on rock bottom, support the 32 piers of the main ship channel crossing. This is a 5,621-ft portion of Structure C, and it includes a through cantilever bridge 1,584 ft long with an 864-ft main span 140 ft above high water.

Foundations for this crossing are under construction, in anticipation of the beginning of steel erection in May.

• **Slabs, beams come to job**—Well under way is superstructure construction in the trestle sections. Schedules for placement of 363 spans of 48 ft and 68 spans of 36-ft call for a steady output—the kind that an owner and contractor could not count on if all work were performed in open water, where a windstorm could disrupt operation for days at a time. Hence beams for the 48-ft spans, and fully precast deck sections for the 36-ft spans, are brought to the job, ready for installation on pile-bent caps.

The story of two contractors' yards for manufacturing trestle units is told in separate sections of this article. One contractor, Hardaway Contracting Co., of Columbus, Ga., has the main-channel bridge foundations and the trestle portions of Structure C, and in addition has two 336-ft stretches of trestle, Structures D and E. The Hardaway trestles have the 48-ft spans, and they feature beams prestressed by the Lee-McCall system of high-strength steel bars. Main-channel crossing superstructure contractor is American Bridge Division, U. S. Steel Co.

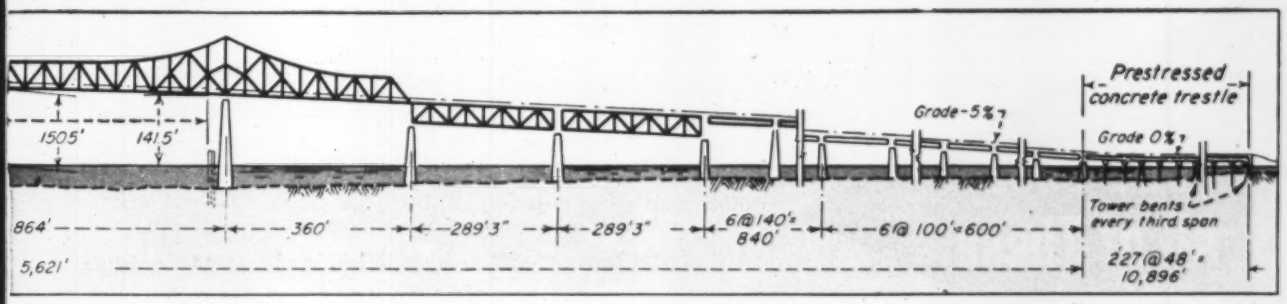
ELEVEN MILES of open water are being crossed by the project. Shaded portions of the location are hydraulic fill.

Contractor for Structures A and B, is Hendry Corp., Rattlesnake, Fla. With the exception of the 122 ft 6-in. bascule span. Structure A is made up of the 36-ft trestle spans—fourteen of them on each side of the bascule. Structure B consists of 20 36-ft trestle spans on each side of an 82-ft steel-girder span across a small boat passage.

Hydraulic fill has been placed by Atlantic Dredging Co., Satsuma, Fla. (north of Structure C) and Benton and Co., St. Petersburg (south of Structure C). Work under the five contractors, amounting to about nine-tenths of all work planned, will cost about $13,000,000. Pavement on hydraulic-filled portions and on Terra Ceia Island remain to be contracted.

• **Alternate designs**—Some question might arise in an engineer's mind as to why part of the trestle has a conventional reinforced concrete superstructure and the rest of it is prestressed. It was a matter of timing, according to Maurice N. Quade, partner in Parsons, Brinckerhoff, Hall and Macdonald, the consulting firm that is handling the job for the Florida State Road Department. Mr. Quade says that the Hendry contract, which was let first, specified two alternates: Precast beam-and-deck units and cast-in-place construction. Precast units were $10,000 cheaper in an $840,000 contract.

• **Prestressing saves $144,000**—Then as the time approached for bid call on Structures C, D and E, the Preload Co., of New York, submitted a third alternate, the prestressed-concrete design, which was approved by the engineers. One advantage of the design was that it permitted economical span



for one-mile trestle at north end (left) and two-mile trestle at south end. Main span steel work will begin in May.

length of 48 ft, compared with 36 ft in the conventional reinforced concrete. When bids were received, Hardaway's $7,615,000, which included the prestressed design, was $184,000 lower than his bid for cast-in-place reinforced concrete (the next-lowest bid received). Subsequent modification of the prestressed design increased the cost by $40,000, resulting in a net saving of $144,000. The original plan, to leave the high-strength prestressing bars unbonded, was changed to bonded construction when fatigue analysis revealed a low-safety condition at the thread-and-nut anchorages of unbonded bars. Bonding relieves anchor nuts of live-load and impact stresses.

According to W. E. Dean, engineer of bridges for the Florida State Road Department, the $144,000 saving figures at $8.26 per linear foot of trestle. Of this amount, $5.50 is saving in superstructure cost; $2.76 is the saving in substructure cost resulting from the use of fewer but larger concrete piles. Net cost per lineal foot is $192.60. Cost per square foot is $5.66—$0.24 cheaper than cast-in-place.

• **At-site construction**—Six prestressed beams are used as stringers for each 48-ft trestle span. They are supported on pile bents, which consist of precast concrete piles, 20 in. square, and cast-in-place caps. Every third bent is a tower bent, consisting of two plumb and four batter piles. The in-between bents have four plumb piles.

Piledriving and capping, as well as all other at-site work, are conducted with floating equipment. When caps are ready to receive stringers a barge-load of twelve 46-ft 10-in. prestressed beams is brought alongside a floating derrick, which is tied alongside the bents. The derrick picks the beams up, one at a time, and sets them in place. It then places precast 4½-in. diaphragms between the stringers at the third points. These diaphragms have holes that line up with holes in the stringers, to accommodate transverse prestressing.

A high-strength bar is inserted through each lineup of diaphragms, tensioned with a jack and nut arrangement, and grouted in. The gaps between stringer-ends of adjacent spans are closed, and a deck structure is cast in place. Roadway width between curbs is 28 ft. Out-to-out dimension is 37 ft 5 in., providing walkways (for fishermen) and guard rails.

• **Precast slabs weigh 62 tons**—Of similar width are the 36-ft trestle decks, but their placement is more spectacular because they come to the site as half-width beam-and-slab units. These units are identical for left- and right-hand installation, one being switched end-for-end to achieve symmetry with the other. Weighing 62 tons, each unit calls for exacting placement by floating crane.

The 100-ton rig Hendry has on the job can set a unit within a half inch of horizontal position and an inch of grade. For the first unit of a span, knee-brace guides are erected at the middle of each cap (see photo, last page.) The unit comes to rest on four hydraulic jacks, positioned on the caps under end diaphragms. The jacks lower the unit carefully to rest, to avoid damage to graphite-inlaid bearing plates. Four-span continuity is provided by welding together bars that project from unit ends.

Every fourth trestle bent is a tower bent in the 36-ft-span trestles.

Prestressing factory makes 36 beams a week

When Hardaway got the major substructure and trestle contract for lower Tampa Bay Bridge it was realized that the production of prestressed beams would be the job's critical point.

For one thing, 2,178 of the beams had to be made; with any economically practicable plant, almost two years of actual production time would be required. This left a year to spare in a three-year contract. But the whole method had to be pioneered: casting yard layout decided; forms designed and fabricated; prestressing bars received from England; sample beams tested; and bugs worked out of the system.

The contract was let in September, 1951. Form fabrication and procurement of high-strength bars from England took about six months. (Similar bars now are produced in the U. S.

Two test beams, one with a piece of deck slab cast on its top, were ready at Hardaway's Port Tampa yard by late spring. Their performance was found to check satisfactorily with the theory, and by summer's end the yard was turning out 24 beams a week. Because this rate meant about 90 weeks of production, placing completion too near the September, 1954, deadline, the contractor put a second set of forms on the job early in December to increase weekly production to 36.

Beams are 46 ft 10 in. long, 3 ft 4 in. deep and 14 in. wide. At their ends and at third points they are rectangular in cross-section. Elsewhere they have an I section with 4-in. web. There are three prestressing bars, each 1-in. round. Two are straight, lying parallel in the bottom flange. The other deflects in the form to a curvature that places its center in the bottom flange, above the first two, and it ends near the top of the beam.

• **Casting yard**—Hardaway's yard is a level spit of made ground, projecting into Tampa Bay. Tracks for a whirler crane flank standard-gage tracks that run out the center of the spit. There are four beam-casting beds on the left side of the tracks (a bulkhead for barge mooring is on this side), and two casting beds on the right side. Beds for casting concrete piles also are on the right.

Each casting bed is a slab of concrete roughly 48x48 ft in plan. Soffit forms for twelve beams are fixed to the concrete. These are beam-width built up of plywood to a height of 4 in. to provide a lateral bearing surface for side forms. Forms are 3/16 in. steel. They are held in place by

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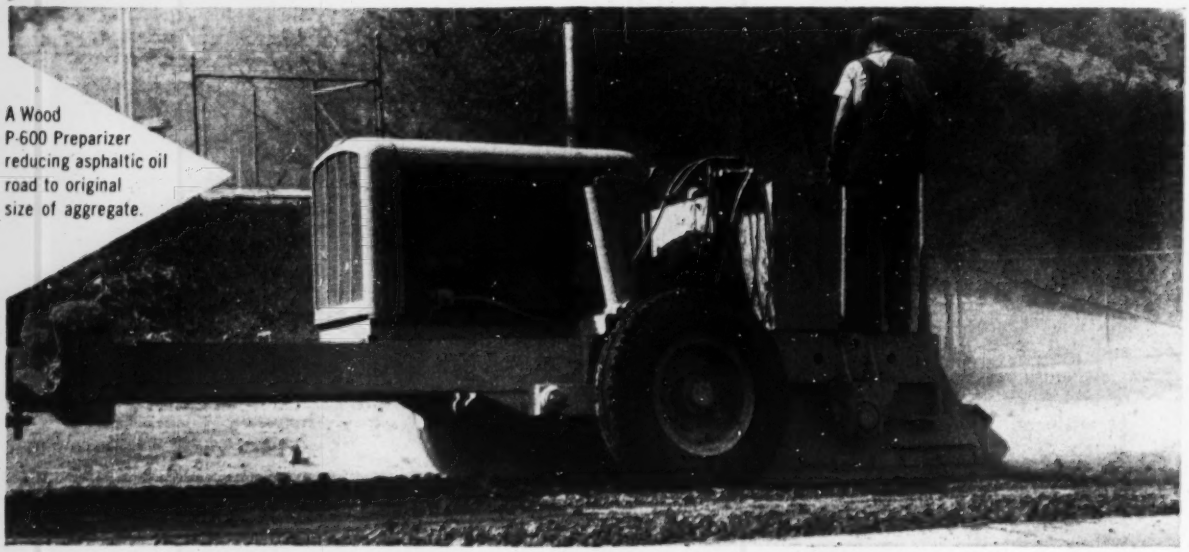

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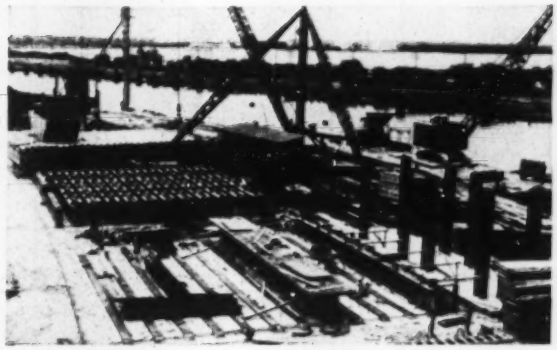
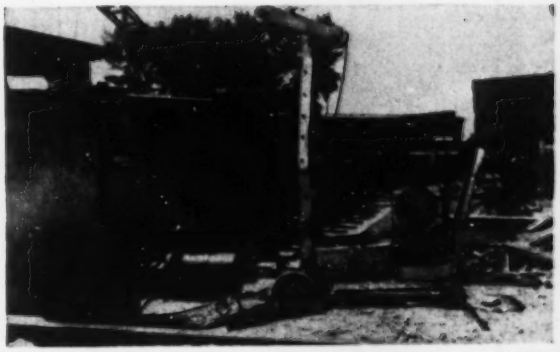
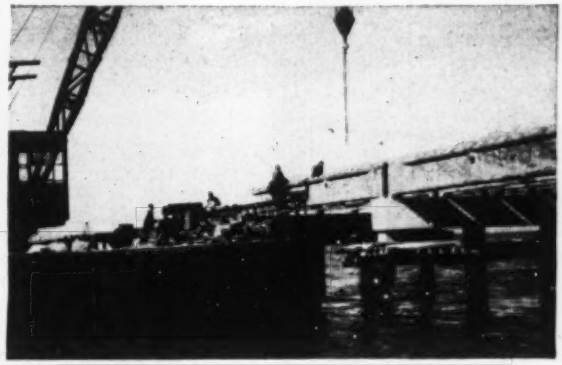


HARDAWAY YARD, showing two of the six stringer-beds (steel forms on upper one), and pile storage beyond.



PRESTRESSING JACK engages thread on high-strength bar, exerts 37-ton pull; load is transferred to special anchorage nut.



FLOATING CRANE places six prestressed stringers on each trestle span. Stringers come to site by barge. (ENR photo)

TRANSVERSE PRESTRESS is applied in field, bars being placed through diaphragms; anchored as shown. (ENR photo)

wedge pairs that bear against stakes in casting-bed holes, and by clamps across their tops. End forms bolt on.

• **Hoses encase bars**—High-strength prestressing bars came to the job cut to precise length and taper-threaded. A special nut, which must fit the taper at a precise point when it is snugged up, is used. The nut and thread assembly is said to develop 96 to 98% of the full-section strength of the bar. Before placement in the forms, bars are threaded through lengths of flexible metal hose. A bar weighs 126 lb. The hose keeps bars bond-free for post-tensioning purposes. Bars and hose are positioned laterally in the forms by special frames, part of which can be withdrawn from the wet concrete. Vertical restraint is provided by ¼-in. and ⅜-in. rods that are inserted through side forms above and below the bars.

Stirrups are placed in the beam ends and steel end forms are bolted to the side forms. The beam now is ready for concrete. When a bed, consisting of twelve beams, is ready, a 34 E paver loads a one-yard bucket, which the whirler crane spots over the forms for concreting.

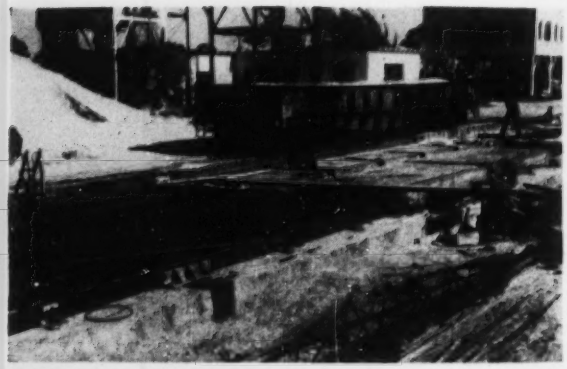
Concrete is designed for 5,000-psi at 28 days, but 7-day strengths have been running around 5,000 psi. Engineers attribute this performance in part to ideal concreting conditions that prevail in the Tampa Bay area. The mix contains 6.5 bags of cement per cubic yard; its slump runs from 4 to 5 in., consistent with workability that is needed to assure full placement around bars and in the 4-in. web. An admixture is used to obtain proper workability and at the same time decrease water content.

A pour of 12 beams is completed in about a half day. Shortly after a beam is concreted and fully vibrated (with electric external vibrators attached to forms), the removable portion of the lateral bar spacer is pulled out the top of the concrete. Horizontal rod positioners are taken out next.

• **Tension after seven days**—Forms are removed in one or two days, so they can be moved to the next bed for twice-a-week use. If the seven-day test cylinders governing a pour show 4,000-psi concrete, full tensioning of the prestressing bars begins on that day. Tension is applied with a portable hydraulic jack (illustrated), which pulls on an adapter sleeve that fits the bar's threads. Jack and prestress reactions are taken by bearing plates that fit in recesses formed in the concrete. Jacking is performed from one end on the lower bars; from both ends on the upper bar. A jack pull of 37 tons establishes the specified 94,400 psi prestress in the bar; bar elongation, measured on a vernier scale on the jack rig is used as a check on frequently calibrated pressure-gages.

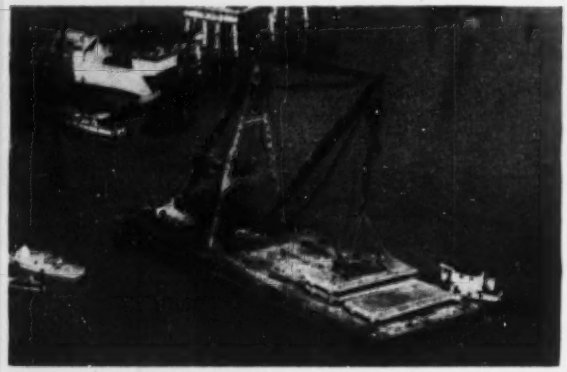
At this point the special nut is turned almost to its most efficient position and split washers are inserted between it and the bearing plate. The nut is then snugged and an easing-off of the jack-gage needle shows that the nut has taken the load. For design purposes shrinkage and creep losses are assumed to be about 15,000 psi maximum during the useful life of the beam.

• **Grout makes the bond**—Bar-bonding with grout in the metal-hose encasement is accomplished with the aid of a ¼-in. pipe nipple that is placed in the end form before concreting. Lying diagonally in a vertical longitudinal plane, the nipple has its upper end projecting from the face of the beam-end. Its lower end touches the bar encasement. When stressing is complete a drill is inserted in the nipple, to make

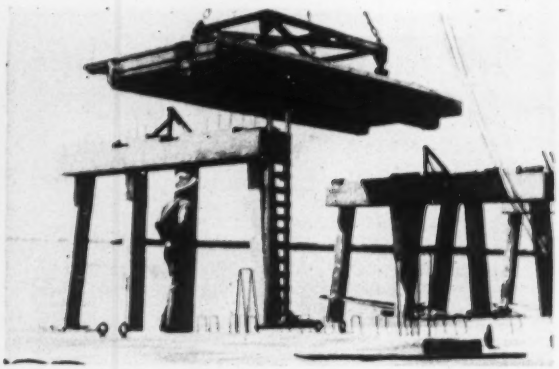


HENDRY YARD, showing two of the seven deck-precasting beds. One awaits concrete (left); the other is bare. (ENR photo)

THE SECRET for success of the Hendry casting molds is an air-operated lifting plate, shown in diaphragm soffit. (ENR photo)



PRECAST UNITS ride to location on foredeck of 100-ton floating crane, which places their 62 tons with precision.



ONTO BENTS goes a precast unit. Steel spreader imparts vertical lifting force. Brackets guide unit to place.

a hole in the hose wall. Then a grout pump is attached to the nipple and injection proceeds.

When grouting is completed in a group of 12 beams the group is ready for shipment to the bridge site.

In charge of the casting yard for Hardaway is Ralph Bird, superintendent. He works under D. M. Plyler, project manager, who also is responsible for at-side work. A. W. Goodale is Hardaway superintendent at the bridge site. A. D. Vick, Jr., of the Preload Const. Corp., supervises prestressing operations, and Les Sutcliffe is the Parsons, Brinckerhoff, Hall and Macdonald representative at the Hardaway yard.

Air system "pops" whole slabs from forms

About a mile away from the prestressing yard, also on Tampa Bay, the Hendry casting yard is turning out as many as seven half-width 36-ft trestle spans a week. With 136 of these monolithic stringer-and-slab units to cast, about six months will have elapsed during their production.

Seven casting beds lie in a row alongside a bulkhead, where the big Hendry floating crane ties up and transfers completed units to its forward deck. Two railroad tracks flank the casting beds. Material cars ride on one track. Cars and a locomotive crane ride the other, the crane handling general hoisting as well as concrete from a batching and mixing plant on the inshore side of the beds.

The casting-yard product is 18 ft 8 in. wide. Slab thickness is 7½ in. and there are two stringers, each with a depth of 3 ft and a width of 1 ft 9¼ in. Three diaphragms, two at the ends and one interior, extend 2 ft below deck level. Stringer and diaphragm edges are curved, to permit easy breaking-away from forms.

Forms are of reinforced concrete, steel-trowled on their upper horizontal surfaces (slab undersides) and sheathed with 12-gage steel where they form stringers and diaphragms. Thickness of the forms varies from 6 in. under slabs to 1 ft 2 in. under stringers. Each form, or casting bed, is supported by eight piles, to prevent settlement and warping on made ground.

• **Air "pops" units loose**—The job's most ingenious feature is the method of loosening new units from their molds. The bottom of each stringer and diaphragm form is a strip of ½-in. plate 8 in. wide. This strip seats over a channel that is just big enough to contain a collapsed 4-in. fire hose. (Similar plate-and-hose assemblies lie flush with the deck form, flanking five cantilver brackets along the unit's outer edge.) Fire hoses are connected by underground piping to an air compressor. When, after concrete has stood five days and passed a 2000-psi compression test, the unit is ready for removal from the mold. Air at 30 psi is turned into the fire hoses and they push upward on the plates.

A unit rises 1½ in. on the fire hoses. Pick-up is accomplished with the aid of a diagonally-braced rectangular steel spreader frame that permits a direct upward pull on two eye-bolts anchored below each of the frame's four corners. Two days are allowed for pick-up, form preparation, steel-setting, concrete placement and finishing, to make a seven-day production cycle on each of the seven casting beds. A force of 30 men handles all work at the yard.

In charge of the Hendry contract is J. A. Kennard, operations superintendent. George H. Ashbell is project engineer, George A. Sahlin is office engineer and Otis Williams is casting yard superintendent. P. A. Hakman is resident engineer on all contracts, for the consulting engineer.

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Parking problem solutions offered in Cincinnati and Kansas City

Other cities propose construction of parking garages as some legislatures consider parking bills

Within the week, Cincinnati, Ohio, city officials had received four different proposals for parking facilities. The one most discussed in official circles was a proposal for two underground garages to be built under Fountain Square and Government Square in the heart of the city.

Mayor Carl W. Rich last May proposed a study of the feasibility of building two four-level garages, each to accommodate 2,000 autos daily.

Last week, City Manager W. R. Kellogg announced that three engineering firms shortly would be invited to make studies of the garage construction. Promoters of the underground facilities—to be patterned after Los Angeles and San Francisco garages—estimate costs at $1.8 million each, or at most a total of $4 million.

Earlier in the week, City Councilman Theodore M. Berry had submitted a proposal for four multi-decked parking garages to be constructed on expanded, existing downtown lots.

Berry offered his proposal as an alternative to still another parking proposal—an eight-site program previously recommended by the city manager's off-street parking committee.

The fourth garage plan under consideration was offered by City Manager Kellogg and called for a combination market-parking center. The three-part proposal listed:

- Construction of a one-story building to house market facilities now located in another city area.
- Construction of double-deck parking facilities atop the new building.
- Turning the present market area into a new off-street parking area on the periphery of the downtown section.

• Missouri city's plan—Kansas City's proposed multi-million dollar parking garage and plaza in the block immediately north of the Municipal Auditorium could become a reality by January, 1955, if construction is started this spring.

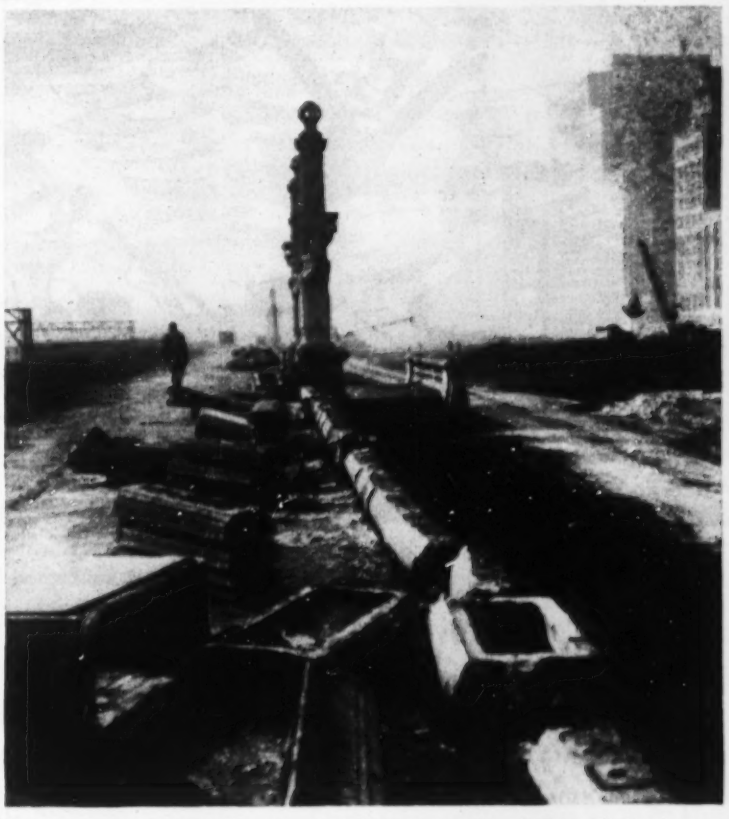
City Manager L. P. Cookingham this month expressed hope it would be possible to advertise for bids within 30 days and start construction in May on the $3.3-million project. Plans call for a three-level building with capacity of 1,350 autos and a potential use by about 4,200 motorists daily.

• Parking elsewhere—In Oakland, Calif., a three-level parking garage with space for 600 autos will be built by the Downtown Merchants Parking Association.

Turner Construction Co. began work last week on the $809,000 Rittenhouse Garage in Philadelphia. Consisting of basement, three floors and a roof of reinforced concrete, the garage will provide 465 public parking stalls.

• Parking legislation—A bill introduced in the Georgia legislature last month would increase the State Office Building Authority's borrowing capacity by $1 million and authorize the agency to finance and construct a dual civic park-underground parking garage in Atlanta.

In a decision clarifying the powers of Florida municipalities to issue revenue bonds for off-street parking facilities, Circuit Judge Bavard B. Shields validated a proposed $3.3-million bond issue which will finance land acquisition and construction of a municipal off-street parking garage in Jacksonville. . . Maryland's House of Delegates gave preliminary approval to a proposal calling for appointment of a commission to study the feasibility for construction of a parking garage under the state house lawn in Annapolis. . . .



Earthmoving equipment digs space in Chicago's tree-cleared Grant Park where an underground garage will be built under Michigan Avenue (right) and the park. Constructed by the Chicago Park District at a cost of over $6.5 million, the garage will park 2,350 cars. A diversionary road will be built (left) for Michigan Avenue before the street is ripped up this spring. Engineers say Michigan Avenue will be back in place by the end of the year. (Wide World photo)

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Moola, moola, hail oh hail!

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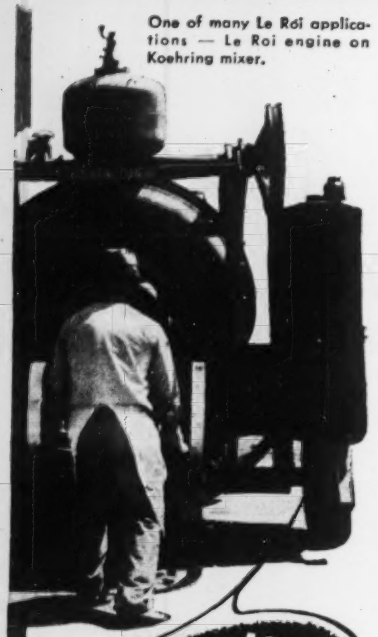
One of many Le Roi applications — Le Roi engine on Koehring mixer.



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Alternate tunnel route proposed

Norfolk planners urge change to costlier but more direct course for Hampton Roads bridge and tunnel

The Norfolk, Va., planning commission has recommended to the Virginia State Highway Commission that the commission's engineers give further study to an alternate route to that favored by the highway body for a bridge-tunnel across Hampton Roads connecting Norfolk and the Virginia peninsula. (ENR Oct. 2, 1952 p. 25)

The alternate route which the Norfolk Planning Commission favors is more expensive than the favored route, but it provides a more nearly direct route from downtown Norfolk to downtown Newport News.

The route backed by the highway commission would run from Willoughby Spit, the northerly-most point in Norfolk to Phoebus on the Virginia peninsula. Causeways would be used to approach the main channel and there a 7,200-ft tunnel would be constructed.

The original cost estimate for this route was $55 million but the highway commission proposed a bond issue of $81.5 million with the additional funds to be used for such extra items as refinancing the state-owned James River Bridge system with which the new route would compete; refinancing the York River bridge; liquidating the state-owned ferry lines across Hampton Roads; and to construct a $12.3-million bridge across the Rappahannock River.

Original cost of the alternate route favored by the planning commission was $103 million, including the extra items. Now, however, the highway commission has amended its estimates to lower the favored route estimate to $78.5 million and to increase the second route, commonly known as the 38th Street route, to $115 million.

The 38th Street route would require a tunnel beneath the Elizabeth River from 38th Street Norfolk, to a point in Norfolk County north of Portsmouth, then a combination land, causeway and tunnel route across Hampton Roads directly into Newport News.

• **Arguments**—The belief among the members of the planning commission is that a greater number of persons would be served by the 38th Street route.

James A. Anderson, Virginia state highway commissioner, said in commenting on the 38th Street route that the financing would require an annual contribution of $1.5 million from sources other than the tolls on the tunnels.

Anderson said that the highway commission from time to time could make a voluntary contribution toward the cost of a revenue bond project, but said the highway commission could not bind itself to do so on a long-range proposition.

Anderson, in connection with the financing of the two routes, noted that, based on an interest rate of 3½%, the estimated debt service coverage from revenues for the Willoughby route is 2.16. Debt service coverage on the other route, from revenues, would be 1.20, or with annual contribution of $1.5 million from other sources would be 1.60.

• **No approval yet**—Army Engineers have not yet approved either route.

Actually the shortest route between Norfolk and Newport News is a third one connecting the Norfolk Naval Base area with the Newport News Boat Harbor Section.

The Navy frowns on this, however, since it would pass through or under the Navy's Hampton Roads anchorage for warships. No effort has been started by the highway commission to obtain approval of this third alternate route.

If constructed the Norfolk-Newport News link would be financed by the highway commission with no local monies going into it.

Stream pollution charges taken to Ohio court

Charges of stream pollution brought against a Silica, Ohio, firm were referred to the Lucas County grand jury following a hearing last week.

E. Rauh & Sons Fertilizer Co. is accused by Lucas County officials of dumping sulphuric acid from its plant into Ten Mile Creek on Jan. 16. The Ohio Wildlife Division has said it will seek damages for the death of an estimated 8,000 fish.

Company officials contend that dumping of the acid was necessary if operations were to continue. The firm produced letters from the Ohio Water Pollution Control Board giving permission to dump waste until Jan. 19.

PERFORATED PIPE for forming a sump.

Perforated pipe sumps solve drainage problem

A street intersection in El Segundo, Calif., had the city engineers worried. There was no storm drainage and no natural runoff, causing recurring flood conditions during heavy rains.

Calco Division of Armco Drainage & Metal Products, Inc., studied the situation and recommended that two 48-in. dia fully perforated corrugated metal pipe be sunk on either side of the street to provide drainage.

Holes were dug to a depth of 20 ft and a 35-ft section of pipe was lowered into place. Digging then proceeded to full depth and the remaining 15-ft of pipe was lowered.

A conventional curb inlet was built with a 12-in. corrugated pipe leadin to the sump. A cast iron ring and manhole cover were installed on the sump to permit cleaning.

After several heavy rains the perforated pipe sumps are reported to be working well. Impressed by this experience, the City of Long Beach ordered six similar sumps, each 45 ft long.

New York cities okay building code

Fifty-five cities in New York State now accept the state building code commission's complete building code. Of this number, 18 previously had building regulations of some kind in force. In these cases, the state code will serve as an alternative to local regulations.

WEBB

PROTECTION

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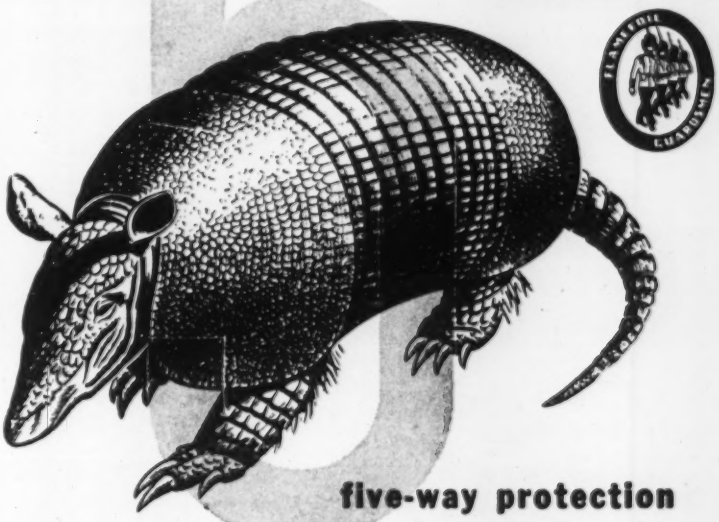

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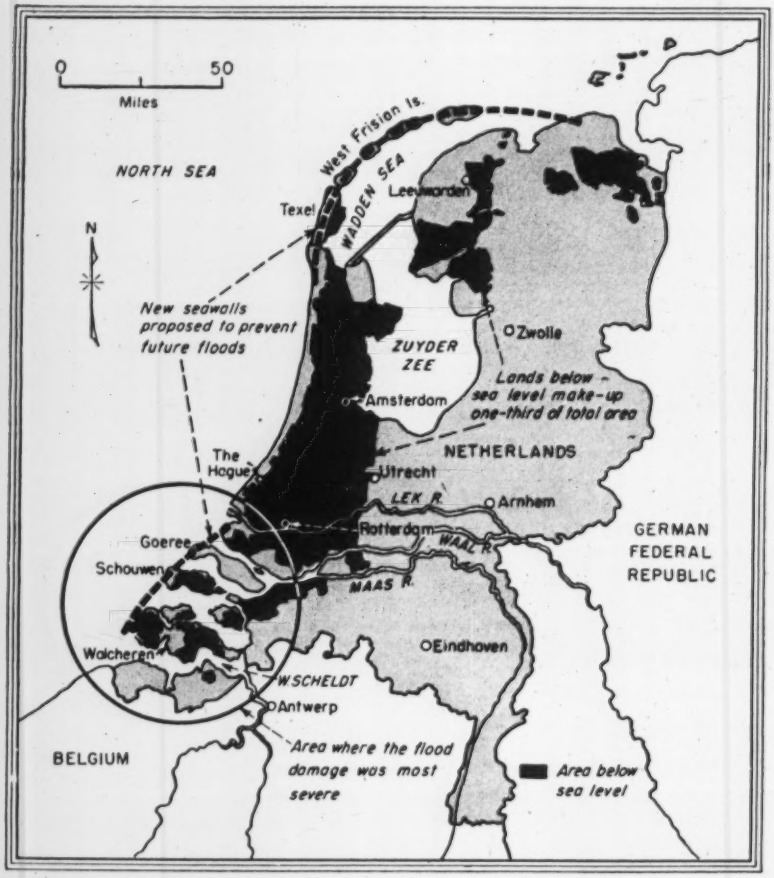


PROPOSED DIKES would solve Holland's centuries-old problem, but current task is to close riddled dikes in the heavily flooded area of the Zeeland.

Dike rebuilding in Netherlands poses great engineering problems

Thirty-seven big breaks up to 200 yards wide and more than 100 smaller ones in Holland's dikes are the reason for a new offensive against the sea being planned by the Dutch government.

The gale-swept flood of Feb. 1, which was identified by scientists as a tidal wave, affected over a tenth of the country's area—a territory containing 5.7% of the country's population and 5.7% of its cultivated land. Damage caused was estimated at $236-million by Premier Willem Dres, and the U. S. has offered the release of over $200 million of the counterpart funds for the rehabilitation work although the Dutch are not anxious to accept the money because of its inflationary effect.

• **Repairs and new designs**—Dike repair is likely to resemble the process used after the war to close gaps in the seawalls made by bombing. Ships and concrete caissons were sunk in the gaps by men who could work effectively only a few minutes a day when the tide was turning. Usually it was necessary to put down rock-weighted wood mattresses on the sea floor to hold the tremendous weight of the dike section from creeping and rolling away on the sandy bottom. Sand and clay topped by soil or asphalt were then filled in around the caissons and sunken ships.

It may be found necessary to build higher dikes, but that would bring on the danger of higher floods, for once a breach is made the level of inundation is determined by the level of the dike. Last week many of the dikes were undermined from behind by water that came over the top, so that probably it will be found necessary to strengthen their inshore sides. The dikes that stood up best under the flood and storm conditions seem to be those with a more gradual incline to the water, and in the future the profile of the dikes may be changed, rather than the height or the strength of the landward side.

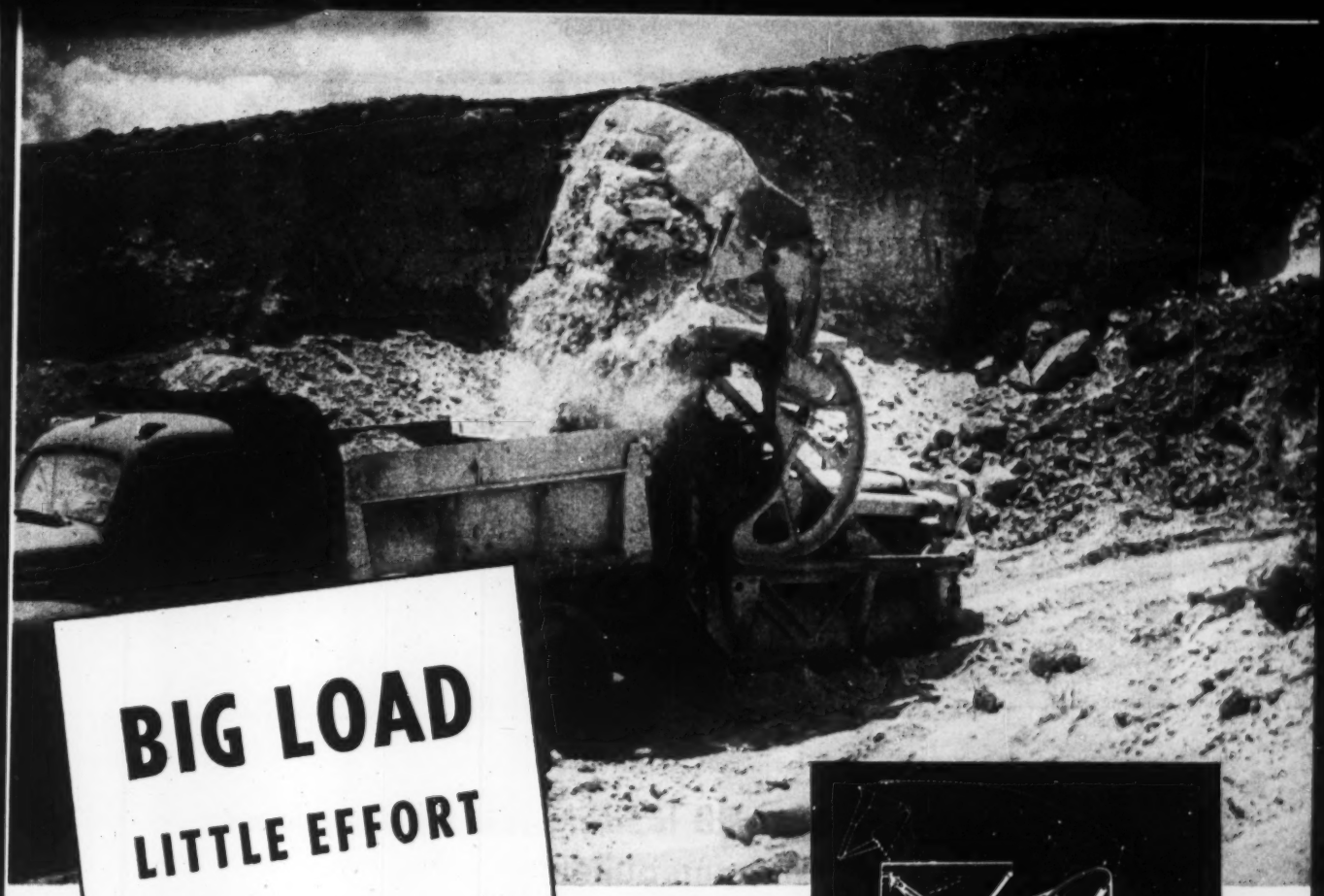
• **Perhaps a new coastline**—A commission of experts, including Prof. Jan T. Thysse, recently called back from his guest lectureship at the University of Michigan, will make an exhaustive study of a plan to erect huge dams to block off the Zuider Zee at the West Frisian Islands and to close off the three main sea arms of the Zeeland. This plan would cut off all Dutch North Sea outlets except the sea approach to Antwerp, Belgium, and to Rotterdam. It would cut the length of the coast line to one third of its present seaward access and would ruin a great many fishing harbors and the famous Zeeland oyster beds. In some places the dams would have to be more than 600-ft deep and they all would have to rest on the uncertain sandy bottom.

The dike problem is an old one to the Dutch. In the last seven centuries they have won a total of 1.4-million acres from the sea and in the same time they lost back to it almost as much again. Today more than a third of the country lies below sea-level and half of it below the recent flood level. In these areas live more than half of the country's population on land lined with old "sleeping" dikes that once held out the sea.

Municipal briefs . . .

• **Cuban office building**—Havana's Provincial College of Architects has announced plans for a $200,000 nine-story building in suburban Vedado. The building, which will have office space, includes a basement, mezzanine, main floor and six additional stories, topped by a penthouse.

• **Waste disposal plan**—In an effort to curb sewage contamination in Havana Bay, Cuba's Ministries of Health and Public Works have announced plans to dredge the bay. In connection with the cleanup program, creeks and sewers which open on the water are to be rerouted.



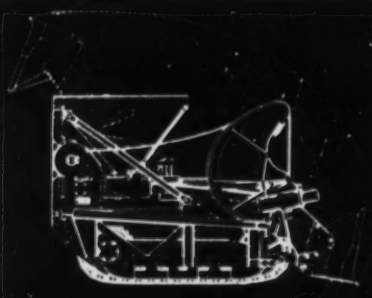
BIG LOAD
LITTLE EFFORT

Loads like this were considered jobs for big heavy equipment not long ago — but today loads this big or bigger can be handled easily with plenty of horsepower in reserve in the power unit.

The secret of the Eimco 104 is in better engineering, better steel castings and the rocker-arm principle described at right — where effort is applied to obtain a maximum in mechanical advantage.

Eimco 104's are heavy-duty loaders. They'll handle rock as easily as sand and gravel. Bucket sizes vary with material being loaded with an average job loading rate of between 200 and 300 yards per hour depending on job conditions.

Eimco 104's are being used for highway maintenance, heavy earthmoving, contracts, tunnels, steel mills, sand and gravel pits and many other jobs. Write for more information on Eimco loaders. Built in 6 different models for all loading jobs.



The rocker-arm principle is used on all Eimco Loaders. This principle, designed to give maximum force at the digging lip while the bucket is being worked up through the muck pile permits crowding forward at the same time so that the bucket will come up full every load.

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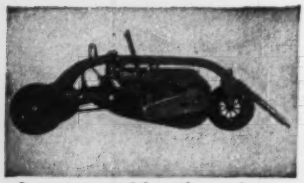

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Chip spreaders 8′ to 12′ width. Also asphaltic concrete spreaders.

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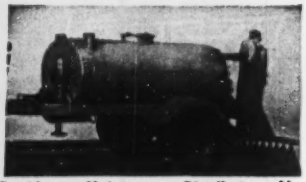

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Sheepsfoot Rollers 250 to 600 psi.

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NEW LEADERS of National Association of Home Builders are: President Emanuel Spiegel (left), and John Dickerman, executive director (right). (ENR photos by Compton)

NAHB leaders see more progress in homebuilding techniques

In the opinions of Emanuel Spiegel and John Dickerman, president and executive director, respectively, of the National Association of Home Builders, the next few years will see an increasing interest in the technical aspects of building and a new standard of professionalism for the members of the association.

The two men recently were elected to their posts at an annual convention in Chicago. Spiegel succeeded Alan Brockbank of Salt Lake City, Utah, and Dickerman took over the tasks handled for 11 years by retiring executive vice-president Frank W. Cortright.

• **Aims of NAHB**—Interviewed by ENGINEERING NEWS-RECORD the two men outlined the aims of the association for the future.

Both agreed that the most important task for homebuilders in the coming year was to achieve at least the million-home mark set by government economists as the minimum goal to meet probable demand.

"But," Spiegel said, "our members will not forget the estimated 43,000,000 units that need some rehabilitation. We must not let our existing wealth of housing be dissipated through neglect."

They declared that to meet this production goal it was necessary that financing be available which permits a modest down payment and low monthly terms.

"We are making suggestions to FHA which, if carried out, will achieve this," Dickerman said.

"Even today," Spiegel added, "there are FHA titles which permit 30- and 40-year mortgages. So what we are proposing is not out of line with current thinking."

To strengthen the money market the association also proposes that the Federal National Mortgage Association should be restored to its original function as a true secondary market for mortgages and that its present authorization should be made a revolving fund.

"We think also that FNMA should have representative builders and lenders in addition to public members," Spiegel said.

Both Spiegel and Dickerman enthusiastically endorsed the NAHB Research Institute. The institute will foster constructive thought and action through the stimulation and correlation of housing research. It will work for more effective operations through the dissemination of knowledge and encouragement of the use of the results of research.

"Our members offer their projects—

"Not let existing housing be dissipated."

or at least part of their projects—as the best field-testing laboratories for any sensible advance in building techniques," Spiegel said.

The association went on record as launching a nation wide crusade for the enactment and enforcement of local and state sanitation and health codes and for laws to require the demolition of structures which do not meet minimum standards and cannot be economically restored.

"Too many structurally-sound buildings are being arbitrarily condemned to make way for housing projects, when they could be rehabilitated at a fraction of the cost of a project," Spiegel said.

• **Future of building industry**—Both men agreed that the increasing number of university courses leading to degrees in home building and light construction indicated that, some time in the future, homebuilding would join the ranks of the academic professions.

Another indication of the maturing of the industry was the exchange of so-called trade secrets.

"The exchange of business and trade methods shows that our members are willing to consider the industry as a whole more important than the individual advantage of knowing a 'secret' method of doing something," Dickerman said.

Both agreed that the most vital advance in homebuilding was in the acceptance of air conditioning as a necessary piece of equipment in all climates of the country.

"It is bound to happen," Spiegel said, "and it may be as much of a change as the advent of central heating. While at first we thought of air

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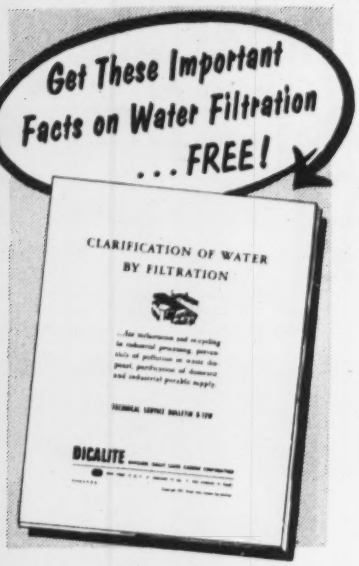

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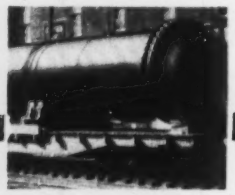

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conditioning as a warm-climate adjunct, now we feel that it—in combination with the entire heating system—will be used everywhere in the country.

• **Spiegel**—Emanuel M. Spiegel of New York City and New Brunswick, N. J., is a second generation home builders with more than 20 years' experience in homebuilding in Metropolitan New York and Northern New Jersey.

He was first vice-president of NAHB in 1952 and has held top flight offices in the association since 1947.

A graduate of St. Lawrence University, Spiegel has been one of NAHB's principal spokesmen before congressional committees and other groups concerned with housing.

He erected a number of New York City apartment houses during the 1928-40 period and went into home building in 1940.

Spiegel has built more than 1,000 single-family homes and several apartment developments. He is now engaged in a low-cost project at New Brunswick, known as "Rutgers Village," which will contain about 400 one-family homes and shopping center.

Spiegel was a founder and charter member of the Home Builders Association of Northern New Jersey and served as its president for two terms in 1947 and 1948. He also served on high NAHB posts during that period.

• **Dickerman**—John M. Dickerman formerly was assistant executive vice-president and legislative director of NAHB. He has been with the trade group since 1947.

Dickerman is a graduate of the University of Illinois, class of '38; law 1940.

A familiar figure in congressional circles, he has been in constant touch with Congress on matters concerning housing: presenting builders' views to Congress; informing members of the organization of the current position of housing legislation; and analyzing and digesting all bills which have impact on the home building industry.

In addition, he is active in consultation with government departments on the formulation of new interpretation of existing housing legislation; is an expert on mortgage financing, and has done notable work in the promotion of slum clearance and rehabilitation programs throughout the country.

Baltimore Plan director resigns in power dispute

G. Yates Cook, director of the Baltimore Plan for slum rehabilitation, has resigned, indicating that he believes the work is being ham-strung under the present set-up.

Officially, Cook has been director of the Housing Bureau, a unit of Baltimore's health department, and his contention is that the bureau should be made a separate agency of the city government.

Cook said he would have retained the post if the bureau had been given independent status.

Cook's work in directing the cleanup of 160 slum blocks was praised heartily by the mayor and the director of the health department, Dr. Huntington Williams, who indicated that he wants the Baltimore Plan to continue as a public health endeavor rather than to expand into an independent agency.

• **More progress**—Cook said the trouble with the present set-up is that his program is faced with the necessity of competing for attention with older phases of health department activity.

Basis of the cleanup plan has been to enforce housing, building and sanitary laws. After the plan was set up in 1945, a special Housing Court was created to hear housing violation cases.

Cook conceded that progress has been rapid, but the bureau needs more personnel and authority. Greater progress could have been made, he said.

According to his view, the Baltimore Plan is not simply for public health but also a program that deals with such matters as paving alleys, street lighting, and building inspection.

Cook plans to take a national job which will let him deal with a number of cities on their rehabilitation plans.

OBITUARIES

Dolfie Shufelt, retired building contractor, died Feb. 9 in Rensselaer, N. Y. He had been a partner in the former contracting firm of Lahey & Shufelt for 55 years.

H. Stanley Bent, 80, former project manager in charge of building the Friant Dam near Fresno, Calif., died in San Marino, Calif., Feb. 8. The Bent Co., the construction firm which he headed, and which was founded by his elder brother, Arthur S. Bent, had been active in construction since 1886 and helped build 32 dams in the Southwest. He had been in virtual retirement since the end of World War II, when he turned the active leadership of the company to his son, H. Stanley Bent, Jr., who was killed in an airplane crash Jan. 7.

Charles T. Hvass, 63, since 1942 vice-president of E. D. Etnyre & Co., Oregon, Ill., died Jan. 9 in New York City. While a student of engineering at Columbia University in 1917 he left to join the U. S. Corps of Engineers at the outbreak of World War I. After the war he joined his father and brother in manufacturing bituminous distributors and street flushers. He was active in the American Road Builders Association, and in the second world war he served on the advisory committee for the Construction Machinery Division of the War Production Board.

Wilbur E. Holl, 67, civil engineer, died at Canton, Ohio, Feb. 8. He was a graduate of Purdue University.

Rasmus Rasmussen, 69, who was connected with Bates & Rogers Construction Corp. of San Francisco for 45 years from 1906 to 1951, died Jan. 21 in San Francisco. He was a 1906 graduate of Michigan State College.

Frank A. Blackston, 63, city engineer of Lawrence, Mass, since 1940, died there on Feb. 10.

R. Guy Skinner, 74, construction engineer, died in Cleveland, Ohio, Feb. 15. He had been with Arthur G. McKee & Co. He helped the Osborn Engineering Co. construct Yankee Stadium in New York City.

Thomas E. Aubrey, 52, retired civil engineer, died at Tuscon, Ariz., Feb. 2. He had been an engineer for the Ohio highway department, Cuyahoga County, Ohio, and the U. S. Corps of Engineers.

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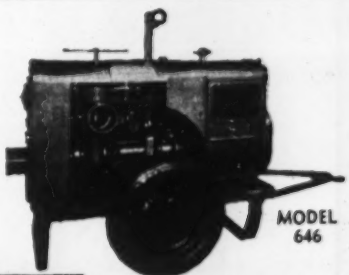

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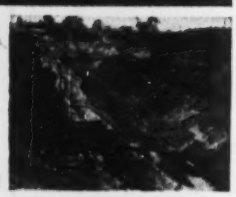
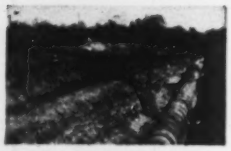
HEAVY CONSTRUCTION



BUILDINGS

SEWERAGE

or any other type of wet work



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UNIT PRICES

Subway extension, Pa.

The Philadelphia Market Street Subway extension will be done by the open cut method, under cover, and without interference with normal traffic or the running of trains. A bid invitation by the Department of Public Property, Bureau of Engineering and Architecture, Lawrence Costello, chief, brought in a contract award bid of $3.2 million by the Kaufman Construction Co., the lowest of five bidders on this project. The second low bid by Lipsett, Inc., New York, was 20% above the low and the Conduit & Foundation Corp. high bid topped the low by 31%.

The new section will be 653 ft long, 60 ft wide for 443 ft, 80 ft wide for 210 ft and will form a link between a presently operating subway and a new section of 4-track subway.

Electrical workers are receiving $3.45 per hr; structural iron workers, $3.32 per hr; and common laborers, $2.05 per hr on this eighteen month job.

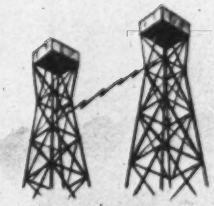
Bidders include:

1C	Kaufman Constr. Co., Inc., Phila., Pa.	$3,197,006
2	Lipsett, Inc., New York 17, N. Y.	3,829,300
5	Conduit & Foundation Corp., Phila., Pa.	4,186,606

Bids: 12-2-52 Items	Unit	Quantity	Unit Prices 1C	2
Rem of interfering parts of old subway struct	ls	1	$285,000	$400,000
Supt & prot of old subway	ls	1	30,000	100,000
Abandonment of part of old subway & rem of abandoned tracks	ls	1	20,000	140,000
Spt, prot, & maint in serv of tracks, subway cars, and trains	ls	1	150,000	121,000
Rem east-west Market St. surface car tracks	ls	1	35,000	35,000
Restore Market St. surface car tracks	ls	1	25,000	31,000
Care of surface car tracks	ls	1	5,000	15,000
F & I tem cables	ls	1	80,000	77,000
F & I scissors crossovers at 29 & 16 Sts., rem signal interlocking control mach cable, misc signals	ls	1	90,000	85,000
Subway exc, any cl mat	cy	50,000	21.00	24.00
Cut & rem subway masy	cy	100	50.00	75.00
Trench exc for pipes, conduits, sewers, etc., any cl mat	cy	1,250	20.00	25.00
Rem pvmnt, exc, grading	cy	1,500	6.00	10.00
Pit exc, any cl material	cy	50	50.00	50.00
Prot & supt of bldgs, five stories or less within zone of influence	ft	450	400.00	300.00
Masy, for underpinning, brl or conc	cy	50	45.00	125.00
Cl "A" conc masy, 1:1½:3	cy	25	70.00	60.00
Cl "AA" conc masy, 1:2:3	cy	25	65.00	55.00
Cl "B" conc, except conc outside of wtrprfng, using std PC with admixture of pozzolith	cy	8,500	50.00	50.00
Cl "B" conc, except conc outside wtrprfng, high early PC with admixture pozzolith	cy	25	60.00	55.00
Cl "C" conc masy, 1:3:6	cy	25	45.00	50.00
Cl "D" conc, standard PC	cy	25	40.00	50.00
Conc base crse for pvng highway bureau stds, use st PC	cy	60	20.00	40.00
use high-early PC	cy	20	25.00	45.00
Cl "B" prot conc, outside wtrprfng, PC with admixture of pozzolith	cy	1,400	50.00	60.00
Tem conc sdwlks, floated surface & tem timber curb	cy	250	30.00	40.00
Reinf conc sheeting	cy	25	80.00	80.00
Cmt grout, any mix	bag	100	5.00	3.00

Items	Unit	Quantity	Unit Prices 1C	2
Granolithic finish without abra wrng surface	sy	550	3.00	5.00
with abr wearing surface	sy	150	4.00	6.00
Abrasive wearing surface without granolithic finish	sy	25	3.00	5.00
Rubbing surface of conc to a smooth finish	sy	1,100	2.50	3.00
Smooth finish conc surfaces special forms	sy	200	2.50	5.00
Special stl forms of bent steel plate	lb	185,000	0.15	1.00
Brl masy	cy	75	90.00	100.00
Hollow tile masy, 2" or 3"	sf	10	1.00	1.00
4"	sf	20	1.00	1.00
6"	sf	50	1.00	1.00
8"	sf	50	1.00	1.00
Rubble stone masy laid in cmt mortar	cy	10	30.00	50.00
Granite cut stone facing in sewer	cy	2	300.00	200.00
Dry rubble masy laid without mortar	cy	10	20.00	45.00
Vit shale brl sewer lining	sy	450	15.00	20.00
Vit sewer liner plates	sy	200	10.00	15.00
Broken stone or pebbles for drains	cy	150	6.00	10.00
VC pipe, 4"	lf	50	2.00	2.00
5" or 6"	lf	100	2.00	2.00
8" or 10"	lf	300	2.50	3.50
12"	lf	500	3.00	4.00
12" channel pipe	lf	30	3.00	4.00
15"	lf	150	4.00	5.00
15" channel pipe	lf	30	4.00	4.00
18" pipe	lf	30	5.00	5.00
18" channel pipe	lf	30	5.00	5.00
20" pipe	lf	30	5.00	7.00
20" channel pipe	lf	30	5.00	7.00
24" pipe	lf	50	6.00	10.00
24" channel pipe	lf	800	6.00	7.00
Ext heavy Cl soil pipe 2"	lf	50	3.00	4.00
3"	lf	50	3.00	5.50
4"	lf	2,000	4.00	7.00
5"	lf	180	5.00	8.00
6"	lf	200	6.00	9.00
8"	lf	300	8.00	12.00
10"	lf	200	10.00	16.50
12"	lf	30	10.00	21.50
15"	lf	30	15.00	25.00
Sewer MH, except exc	ea	8	500.00	500.00
Sewer well holes, except excavation	vf	20	50.00	50.00
St city inlets, except exc	ea	9	350.00	450.00
St water bureau valve MH, except exc, cstng, pvng	ea	19	80.00	100.00
St high pressure fire service MH except exc castings & paving	ea	2	150.00	500.00
Mem wtrprfng laid in asphaltic compound one-ply	sy	20	1.50	2.00
two-ply	sy	20	2.00	3.00
three-ply	sy	5,000	4.00	3.00
four-ply	sy	50	5.00	4.50
six-ply	sy	5,000	6.50	5.00
One-ply double thick dry roofing felt	sy	50	1.50	1.00
Riveted str stl	lb	1,000	0.50	0.60
Str stl beams and shapes	lb	1,500,000	0.20	0.185
Steel ventilation gratings				
Gratings 2¼" deep, with frames	sf	400	6.00	10.00
Misc stl or WI for ladders, stairs, etc	lb	2,000	0.60	1.00
Tie rods, bolts, nuts, washers, dowels & anchor bolts	lb	30,000	0.20	0.35
Stl wire lath & anchors	lb	400	0.50	0.60
Deformed stl reinf bars in concrete	lb	430,000	0.12	0.15
WI or stl pipe, screw or flange jointed				
WI pipe, except electric conduits	lb	200	0.60	1.00
3½" galv WI pipe for elec cond, incl couplings & bushings	lf	500	3.00	4.50
3" galv WI pipe for elec cond incl couplings & bushings	lf	100	3.00	3.00
Stl pipe, except for handrails and water mains	lb	100	0.50	1.00
Misc stl cstngs	lb	100	1.00	2.00
Cut & rem str stl incl that embedded in conc	lb	1,000	0.20	0.50
Cl frames & covers for MH except sew MH, for water stop & vent boxes	lb	18,000	0.20	0.25
Misc iron cstngs	lb	4,000	0.50	1.00

Continued March 12

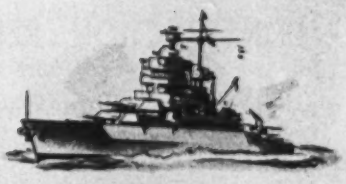


1922—First power line carrier current equipment installed.

1944—First application of frequency modulation to power line carrier current equipment.

1947—First microwave relay system in commercial operation.

1875—Elihu Thomson, one of the founders of General Electric, transmitted and received wireless signals for a distance of about a hundred feet.



1915—Sample radio-telephone transmitter installed on two U. S. battleships and used in 1916 Spring Naval Maneuvers.

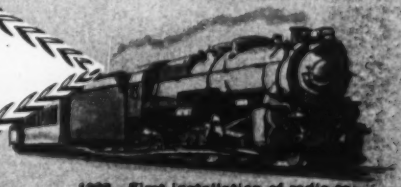
1931—Sonic locator developed for use by ships in fog. It was the first step toward radar.

1937—First application of radio communication aboard fireboats. New York City Fire Dept. installation.

1878 75 1953

YEARS OF ELECTRICAL PROGRESS

1923—First airmail plane radio communication equipment installed and tested.

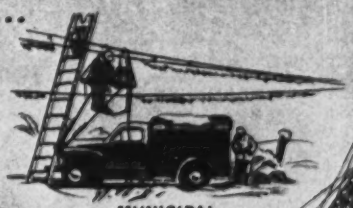


1922—First installation of radio receiver aboard Pullman cars.

1927—First front-to-rear railroad communication equipment installed.

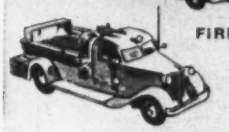
and today...

INDUSTRIAL 2-WAY RADIO

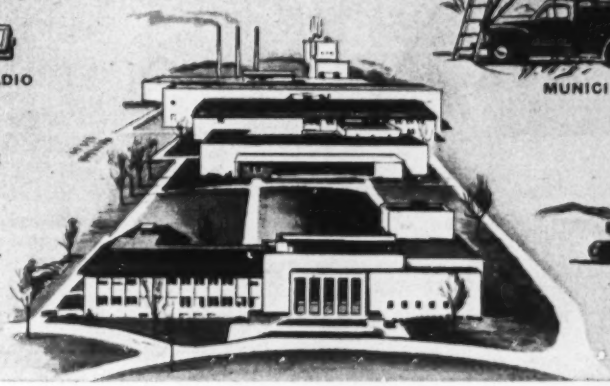


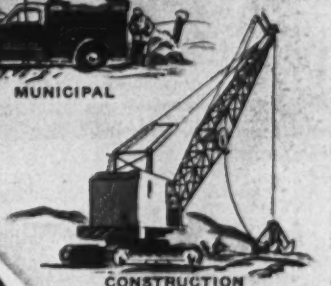
MUNICIPAL

POLICE



FIRE DEPTS.





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GENERAL ELECTRIC

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.
ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—BUILDINGS

▲ **Comn., Manchester**—SCHOOL—B.A. 3/4—Town J. H. Sheekey, 2 story, brick, steel, concrete elementary school, Vernon and Lydall Sts. $1,340,185. Plans deposit $50. Ebbets Frid & Prentice, 862 Asylum St., Hartford, archts. CD 3/13.

▲ **N. H., Newington**—PLANT—B.A. 3/9—Simplex Wire & Cable Co., 79 Sidney St., Cambridge, Mass., mfg. plant and test bldg., off Rte. 16. $1,000,000. Charles T. Main, Inc., 80 Federal St., Boston, Mass., engr. CD 2/3.

SOON LETS CONTRACT—BUILDINGS

Mass., Cambridge—FREIGHT TERMINAL—At office Caproni Assoc., archts., 1221 Chapel St., New Haven, Conn., soon lets contract 1 story, brick, steel, 66,000 sq. ft. freight terminal with concrete fdn. for Adley Express Co., Inc., 60 Lansdowne St., Cambridge, Mass. $950,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Campanella & Cardi Constr. Co., 780 Jefferson Blvd., Warwick, R. I. CA **$1,306,966**, est. $1,530,000. Mid-Cape Hy. South Lane, Bourne-Sandwich and Barnstable. CD 1/30, under LB.

▲ **CONNECTICUT**—State Hy. Dpt., State Office Bldg., Hartford,

M. A. Gammino Constr. Co., 728 Valey St., Providence, R. I.; LB, **$1,631,173**, about 50,816 lin. ft. grading, drainage, c. conc. pavement on Eastbound Roadway, Rte. 15, incl. rolled beam bridge, 7 box culverts, etc. Tolland-Willimgton-Ashford and Union. Bids Feb. 9. CD 1/30.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **First Municipal Parking Corp.**, c/o Jerome Rappaport, clk., 120 Potter St., Cambridge, Mass. LB submitted offer to build, finance and lease off street parking GARAGE Milk, Pearl, Congress and Franklin Sts. at $83,457 for 40 years when garage becomes property of City of Boston. Construction cost **$1,250,000**, BOSTON, MASS. City, Real Estate Comm., City Hall Annex, Boston, Mass. CD 12/14/50.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—State Dpt. P. Wks., The Governor Alfred E. Smith State Office Bldg., Albany,

Savin Constr. Corp., 10 Village St., East Hartford, Conn. LB **$4,536,190**, est. $6,075,000, grading, paving, drainage facilities 5.63 mi. Limestreet to Rte. 9W, New York State Thruway, Greene Co.; LB **$7,068,347**, est. $8,344,000, grading, paving, drainage facilities 3.94 mi. Rt. 23A, Catskill Creek, New York State Thruway, Greene Co.;

I. & O. A. Slutzky, Hunter, N. Y., LB **$235,235**, est. $250,000, b. conc. 1.08 mi. two sections, Rte. 81, Greene Co.;

Slattery Contg. Co., Inc., 46-36 54 Rd., Long Island City, N. Y., LB **$2,263,400**, est. $2,742,000, grading, paving, drainage facilities, utilities, retaining walls 0.66 mi. Major Deegan Expressway, Bronx Co.;

Lizza & Sons, Inc., 21 Orchard St., Oyster Bay, N. Y. LB **$736,449**, est. $874,000, wid'n., b. conc. resurf. 2.52 mi. Hillside Ave. (Rte. 25B) from New York City line easterly to Herricks Rd. Town of North Hempstead, Nassau Co.;

Collins Bros., Waterford Rd., Mechanicville, N. Y., LB **$158,969**, est. $189,000, grading, paving 0.39 mi. Washington Ave. exten. west of Fuller Rd., city of Albany, Albany Co.;

D. V. Frione & Co., Inc., 87 Foxon St., New Haven, Conn., LB **$4,973,081**, est. $5,825,000, grading, paving, drainage facilities 7.62 mi. sect. Thruway from Western Ave. (Rte. 20) in McKownville, west of Albany, northwesterly across Rte. 146 to Albany-Schenectady Co. line, concrete, b. conc. or grav. 6.24 mi. various intersecting and access roads, 2 traffic interchanges and building 6 bridges to carry traffic over Thruway, bridges at Rapp, Karner, Old State Rds., Rte. 146, Washington Ave. Interchange and the Schenectady Spur Interchange, Mohawk Sect., State Thruway, Albany and Schenectady Counties;

B. Perini & Sons, Inc., 73 Montwait Ave., Framingham, Mass., LB **$10,972,514**, est. $12,252,000 grading, paving, drainage facilities 13.34 mi. sect. Thruway from approx. 1½ mi. west of Randall, through Fultonville, north of Auriesville and over Schoharie Creek to point southeast of Ft. Huntter and west of County Rte. 44. incl. constr. 4.65 mi. access roads, relocation of portion of New York Central's West Shore R.R. tracks, constr. of traffic interchange facilities at Fultonville and building 8 bridges at various points along the route, Montgomery Co.;

D. W. Winkelman Co., Inc., Heffernan Bldg., Syracuse, N. Y. LB **$996,874**, est. $1,017,000, construct 2 traffic interchanges Rtes 48 and 57, New York State Thruway, Onondaga Co. Bids Feb. 11. CD 1/21, 1/22.

▲ **D. C., Wash.**—District of Columbia, Director of Hys., District Bldg., 14 and E Sts. N.W., Zone 4,

Alexander & Repass, 309 Security Bldg., Des Moines, Ia., LB, **$845,955**, Pennsylvania Ave. R.R. Bridge; LB, **$180,995**, South Dakota Ave. N.E. two bridges on New York Ave. N.E., Bids Feb. 11. CD 1/12.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **John Kinner & Assoc.**, Park Ave., Corning, N. Y., LB **$1,429,340**, Junior-Senior HIGH SCHOOL and BUS GARAGE, BATH, N.Y. Bd. Educ., Central School Dist. No. 2 of Towns of Bath, Cameron, Wheeler, Urbana, Thurston, Avoca and Howard, High School Bldg., Bath, N.Y. Bids Feb. 3. CD 1/14.

▲ **Leon D. DeMatteis Constr. Corp.**, 827 Elmont Rd., Elmont, N.Y., CA. **$1,426,191**, Junior HIGH SCHOOL, Jerusalem Ave., NORTH BELLMORE, N.Y. Bd. Educ., Central School Dist. 3, North Bellmore, N.Y. Bids Jan. 5. CD 12/17.

▲ **Leon D. DeMatteis Constr. Corp.**, 827 Elmont Rd., Elmont, N.Y., CA. **$1,411,325**, Junior HIGH SCHOOL, S. Merrick Ave., NORTH MERRICK, N.Y. Bd. Educ., Central School 3, North Bellmore, N. Y. Bids Jan. 5. CA 12/17.

▲ **A. Kaplen & Sons, Ltd.** (Sponsor), 80 Huguenot Ave., Englewood, N. J., CA. **$1,699,000**, construct, manage, finance, 200 unit HOUSING, near U. S. Army Signal Corp, TOBYHANNA, PA. U. S. Eng., 121 N. Broad St., Phila., Pa. Bids Feb. 11. CD 2/5.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

▲† **La., Alexandria**—RUNWAY and TAXIWAY—B.A. 3/18—U. S. Eng., 300 Broadway, Little Rock, Ark., extension runway and taxiway, necessary drainage, appurtenances, No. Inv. 53-35, $1,000,000. CD 5/6/52 under LB.

BIDS ASKED—BUILDINGS

▲ **Ala., Calera**—PLANT—B.A. After 3/2—Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, Pa., electrode mfg. plant, $3,000,000. Warren, Knight & Davis, Protective Life Bldg., Birmingham, archts. CD 12/30

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger; water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects inviived except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

▲ **W. Va., Bluefield**—LONGHOUSE—B.A. 3/4—Norfolk & Western Ry. Co., A. B. Stone, ch. engr., General Office Bldg.Roanoke 17, Va., Longhouse, $1,375,000.

▲ **Ala., Fort McClellan**—HOUSING—B.A. 3/10—U. S. Eng. South Atlantic Div., P.O. Box 1889, Atlanta, Ga., construct, manage and finance, 175 Wherry Act Housing Units, $1,500,000. Extended date. CD 2/3.

▲ **S. C., Charleston**—DORMITORY—3/13—Medical College of South Carolina, 16 Lucas St., dormitory for medical college. $1,000,000. Extended date. Hopkins, Baker & Gill, Florence, archts., Dotterer Eng. Co., 12 Exchange St., engrs. CD 2/3.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **R. P. Farnsworth & Co.**, P.O. Box 850, New Orleans, La., LB **$2,610,000**. electrical-electronics bldg., at Naval Base, CHARLESTON, S. C., P. Wks. Office, Box 365, Naval Base, Charleston, S. C. Bids Feb. 12. CD 2/4.

▲† **Ivey Bros.**, 3224 Peachtree Rd., Atlanta, Ga., CA, **$1,171,790**, hangar, washrack fire protection sys., Hunter Air Force Base, Inv. 53-29, SAVANNAH, GA. U. S. Eng., 200 E. St. Julian St., Savannah, Ga. Bids Feb. 5. CD 2/10, under LB.

▲† **Southern Road Builders, Inc.**, Augusta, Ga., LB **$1,428,301**, operational apron, Brookley Air Force Base, Inv. 53-41, MOBILE, ALA. U. S. Eng., P.O. Box 1169, Mobile 7, Ala. CD 10/31.

BUILDINGS

LOW BIDS AND CONTRACTS

Ira H. Hardin Co., 174 Mills St. N.W., Atlanta, Ga., LB. Est. **$750,000**, WAREHOUSE addn., ATLANTA, GA. Sears, Roebuck & Co., Ponce De Leon Ave. N.E., Atlanta, Ga. Bids Feb. 11. CD 2/11.

▲ **Universal Contractors**, Daytona Beach, Fla., Owner Builds. **$1,500,000**, 150 RESIDENCES, ORMOND, FLA.

▲ **G. A. Paul**, Gate City, Birmingham, Ala., LB **$1,154,777**. HOUSING, Project ALA 47-3, HUNTSVILLE, ALA. Huntsville Housing Auth., Huntsville, Ala. Bids Feb. 12. CD 1/20.

Caldwell & McCann, P.O. Box 477, Baton Rouge, La. LB. **$739,995**. CHURCH, BATON ROUGE, LA. First Baptist Church, Convention St., Baton Rouge, La. Bids Feb. 12. CD 1/8.

▲ **J. W. Bateson Co., Inc.**, Erwin-Keasler Bldg., Dallas, Tex. LB. **$2,398,000**. 430 temporary DWELLING units, 9 LAUNDRIES, 1 COMMUNITY BLDG., CAMP BRECKENRIDGE, KY. Public Housing Admin., 900 N. Lombardy St., Richmond, Va. Bids Feb. 12. CD 1/29.

John B. Goodwin Co., Commerce Title Bldg., Memphis, Tenn. Owner Builds. **$700,000**. 50 RESIDENCES, Parkland St., MEMPHIS, TENN.

MIDDLE WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

OHIO—State Hy. Dpt., Columbus,

Wonder & Mason, Worthington, O., LB **$875,032**, est. $769,740, two bridges over Muskingum River, Rte. 32, continuous steel beam with concrete deck 156 ft. long, paving 1,472 ft. of roadway, plus footbridge 808 ft. long, adjacent to Ohio Power Co. Plant, at Philo, Muskingum Co. Bids Feb. 10. CD 1/12, under Streets and Roads.

▲ **Herlihy Midcontinent Co.**, 135 S. La Salle St., Chicago 3, Ill., CA, **$1,096,247**, 2 level highway Wacker Dr. from Adams St. to Jackson Blvd., CHICAGO, ILL., City, City Hall, Chicago, Ill. Bids Dec. 11, awarded Feb. 9. CD 12/16, under LB.

Herlihy-Midcontinent Co., 135 S. La Salle St., Chicago 3, Ill., CA, **$735,174**. Congress Expressway Halsted St. Interchange, CHICAGO, ILL., City, City Hall, Chicago, Ill. Awarded Feb. 9. CD 1/9, under LB.

▲ **Bryant & Detwiler Co.**, 2304 Penobscot Bldg., Detroit, Mich. CA **$2,315,000**. Contr. NE-3, low lift pumping structure, 11000 East Eight Mile Rd., Northeast Pumping Station, DETROIT, MICH. City, Oscar Wagner, pres. Bd. Water Comrs., 735 Randolph St., Detroit 26, Mich. Bids Feb. 5. CD 1/19.

▲ **Bryant & Detwiler Co.**, 2304 Penobscot Bldg., Detroit, Mich. CA **$3,600,000**. Contr. NE-5, settling basins, foundations for chemical bldg., rein.-con. 469x516 ft., 25 ft. deep basins, concrete slab foundation, 63x186 ft. chamber wells and conduits, DETROIT, MICH. City, Oscar Wagner, pres. Bd. Water Comrs., 735 Randolph St., Detroit 26, Mich. Bids Jan. 29. CD 1/8.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Frank Messer & Son, Inc.**, Paddock Rd., Cincinnati, O., CA. **$1,793,700**. 3 story, bsmnt. rein.-con., masonry Basin Senior HIGH SCHOOL, North Washington Park, CINCINNATI, O. Bd. Educ., 216 E. 9

St., Cincinnati, O. Bids Feb. 4, awarded Feb. 9. CD 2/10, under LB.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Union Pacific R.R.**, W. C. Perkins, ch. engr., 1416 Dodge St., Omaha 2, Neb. Owner Builds. $20,963,000, track relaying and ballasting program, relay 624 mi. track and put in crushed rock ballast on 430 mi. track, NEBRASKA, WYOMING, MONTANA, IDAHO, OREGON, WASHINGTON, KANSAS, COLORADO, UTAH, NEVADA, CALIFORNIA.

▲† **Nolan Bros., Inc.**, 210 Builders Exchange Bldg., Minneapolis, Minn. CA. $2,275,751, est. $2,389,031, Alt. B, runway and taxiway extens. and warm up apron, Carswell Air Force Base, ENG 41-443-53-31, FORT WORTH, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. (Correction—contractor). Bids Dec. 18, awarded Jan. 31. CD 1/2, under CA.

BIDS ASKED—BUILDINGS

▲ **Okla., Lawton**—HIGH SCHOOL—B.A. 3/9—Bd. Educ., Lawton, Senior High School. $1,723,000. Noftsger & Lawrence, 2756 N.W. 23 St., Oklahoma City, archts. CD 8/27.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **G W L Constr. Co.**, P.O. Box 455, North Little Rock, Ark. CA $2,244,949, temporary HOUSING Proj. No. Mo.-2-D-1, FORT LEONARD WOOD, MO. Public Housing Admin., 201 N. Wells St., Chicago, Ill. CD 2/13 under LB.

▲ **Lembke, Clough & King**, Box 245, Albuquerque, N.M. CA $2,010,000. COMMERCIAL BLDG., ALBUQUERQUE, N. M. Simms Building, 400 W. Gold Ave., Albuquerque, N. M. (Correction-cost). CD 2/16, under LB.

FAR WEST

SOON LETS CONTRACT—BUILDINGS

▲ **Wash., Seattle**—OFFICE—Pacific Telephone & Telegraph Co., 3 Ave. and Seneca St., Zone 1, soon lets contract 4 story, part bsmnt., 120 x 292 ft., rein.-con. office, to house accounting departments, $1,500,000. Jones & Bindon, Hoge Bldg., Zone 4, archts. CD 8/14/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

WASHINGTON—State Hy. Comm., Olympia,
M. P. Butler, 3419 13 Ave. S.W., Seattle, Wash., CA, $930,424, steel truss-swing-span bridge with rein.-con. slab approach spans over Steamboat Slough Hy. 1 between Everett and Marysville, Snohomish Co. Bids Feb. 10, awarded Feb. 10. CD 1/291.

▲† **Cherf Bros. & Sandkays Constr. Co.**, Ephrata, Wash., LB, $2,471,686, est. $2,926,969, grading, draining, paving apron and warm-up pad Larson Air Force Base Inv. 53-34, MOSES LAKE, WASH. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Feb. 11. CD 1/14.

▲† **N. Fiorito Co.**, 844 W. 48 St., Seattle, Wash., CA, $1,282,174, est. $1,327,028 maintenance nose docks and apron paving McChord Air Force Base, Inv. 53-82, TACOMA, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Feb. 6. CD 2/10, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Carl N. Swenson Co.**, 1095 Stockton Ave., San Jose, Calif., CA, $5,000,000. PLANT to produce steel castings, 9200 Edes Ave., OAKLAND, CALIF. General Metals Corp., 701 105 Ave., Oakland, Calif. Bids Jan. 21, awarded Feb. 3. CD 1/9.

▲ **Carl J. Henchen**, 2940 Garfield Ave., Carmichael, Calif., CA, $2,000,000, STORE ALTERATIONS, SACRAMENTO, CALIF. Hale's Department Store, 9 and K Sts., Sacramento, Calif. Awarded Feb. 9.

CANADA

BIDS ASKED—BUILDINGS

▲ **Ont., London**—DEPARTMENT STORE—Bids Asked—Simpson's Ltd., 149 Dundas St., 5 story department store addn., Dundas and Richmond Sts. $2,000,000. H. C. Dorley, c/o owner, 176 Yonge St., Toronto, engr. CD 10/24/51.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **L. Martin**, Fairbanks, Alaska. CA $976,240, 2 story, part bsmnt., rein.-con. remote transmitter facility, Eielson Air Force Base, ENG-95-507-53-12, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Feb. 6. CD 2/4.

▲† **J. C. Boespflug Constr. Co.**, 1912 Fourth Ave. S., Seattle, Wash., CA. $8,443,400, est. $8,863,356. 7 story hospital, Elmendorf Air Force Base, Inv. 53-34. ALASKA. U. S. Eng., Anchorage, Alaska. Bids Feb. 6. CD 2/10, under LB.

▲† **Grove, Shepherd, Wilson & Kruge**, 120 6 Ave. N., Seattle, Wash. LB. $1,018,281, est. $1,046,651, two 68x360 ft. rein.-con. organizational maintenance shops, 2 gas dispensing stations; Ladd Air Force Base; Peter Kiewit Sons Co., 1300 Aloha St., Seattle, Wash. LB. $557,727, est. $557,317, one 68x360 ft. rein.-con. organizational maintenance shop, two gas dispensing stations, Eielson Air Force Base, ENG-95-507-53-50, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Feb. 9. CD 1/14.

▲† **Raber & Kief and Raber & Co.**, 420 Queen Anne Ave., Seattle, Wash., CA. $1,273,500, 3 story, 31x281 ft. rein.-con. Marine Barracks and brig bldg., 33x61 ft. garage, re-sealing 1,100,000 sq. yd. runway at Naval Station, Spec. 31618, ADAK, ALASKA. P. Wks. Officer, 17th Naval Dist., Kodiak, Alaska. Bids Feb. 6. CD 1/7.

BUILDINGS

LOW BIDS AND CONTRACTS

† **Brezina Constr. Co.**, Rapid City, S. D., CA. $765,981. 3 story, part bsmnt., 45,000 sq. ft., concrete and masonry ADMINISTRATION BLDG., Inv. 53-35, FORT RICHARDSON, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Jan. 22. CD 1/27, under LB.

U. S. POSSESSIONS

BIDS ASKED—BUILDINGS

Canal Zone, Cardenas—BUILDINGS—B.A. 4/15—At office of the Engineering and Construction Dir., The Panama Canal,, Balboa Heights, preparation of sites and constr. of utilities, pavements and buildings for Cardenas Townsite incl. 66 masonry type quarters bldgs., one telephone exchange and one electrical substation. Plans deposit $40; adv. ENR 2/19.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Republic Constr. & Maintenance Co., Inc.**, P. O. Box 9126, Santurce, Puerto Rico, CA. $2,251,000, Group 1 Sect. A, Charlotte Amalie HIGH SCHOOL and Group 2, Sect. A, Christiansted Consolidated SCHOOL, ST. THOMAS and ST. CROIX, VIRGIN ISLANDS. Office of Territories, Dpt. Interior, Interior Bldg., Wash. 25, D. C. Bids Jan. 12. CD 1/20, under LB.

Proposed Projects——

WATER SUPPLY

▲ **Mich., Benton**—Benton Twp., water sys., storage and distr. facilities. $1,500,000. R. W. Petrie & Assoc., 557 Paw Paw St., Benton Harbor, engrs.

▲ **Tex., Houston**—City, City Hall, 900 Brazos St., addnl. extens imprvs. to existing water lines, $4,289,000, expansion water filter plant by 25 m. g. daily capacity, $2,500,000, 25 m. g. water main along en-

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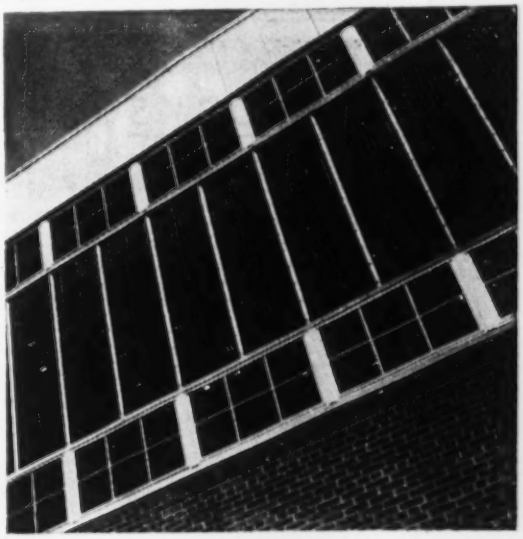

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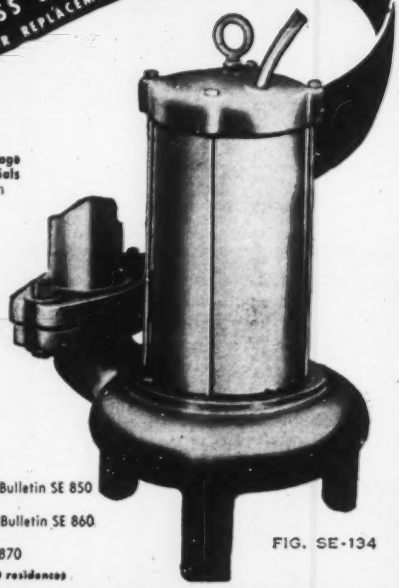

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tire south end of city, $5,000,000, Frank Baldwin, dir. P. Wks. Eng. Dpt., drilling, developing deep water supply wells, in northeast sect. of city, $40,000, in Hermann Park area, $100,000, W. E. White, city engr.; construct c.i. or concrete water mains, Robertson Ave. and Fulton St. $55,000, Hirsch and Hardy Sts. $90,000, Love St., $85,000, Crane St. $70,000, Lockwood & Andrews, Union Natl. Bank Bldg., consult. engrs.; drilling, developing deep water supply wells, in Area No. 1 $125,000, Area No. 2 $80,000, Area No. 3, $105,000, foregoing in Southwest Field, W. E. White, city engr. CD 6/14/49.

SEWERS, WASTE DISPOSAL

▲ Ill., East St. Louis—City, Alvin G. Field, mayor, City Hall, Missouri Ave. and Main St., trunk line sewer line from 20 St. and Ohio Ave. to 38 St. and Caseyville Ave., $2,250,000, 60 in. branch for connection of Oak Park-Edgemont System, $1,400,000. Horner & Shifrin, Shell Bldg., 1221 Locust St., St. Louis, 3, Mo., consult. engrs. CD 3/14.

▲ Mich., Benton—Benton Twp., sewerage sys., incl. trunk and laterals sewers, sewer mains, sewage disposal plant treatment facilities. $1,700,000. R. W. Petrie & Assocs., 557 Paw Paw Ave., Benton Harbor, engrs. CD 5/9.

BRIDGES

▲ Calif., San Francisco—Bd. of Directors Golden Gate Bridge & Highway Dist., Toll Plaza Fort Scott, adding bottom lateral bracing system of 6,450 ft. length of bridge to steady bridge against high winds San Francisco to Marin Co., Golden Gate Bridge. $3,500,000.

▲ OHIO—State Hy. Dpt., Columbus,
Cuyahoga Co.—railroad overpass and relocation of highway crossing at Brookpark and Smith Rds. and W. 150 St., Brook Park and Cleveland, $3,000,000. Albert S. Porter, Standard Bldg., Cleveland, engr. CD 12/10/43 under O., Cleveland.

STREETS AND ROADS

▲ NEW YORK—Dpt. P. Wks., Alfred E. Smith Memorial Bldg., Albany, Zone 1,
Clinton Co.—7.8 mi. arterial routes in Plattsburgh, $3,583,000; 14.1 mi. relocating Rtes. U. S. 9 and N. Y. 22 with location connections, outside Plattsburgh, $6,404,000.

▲ Va., Arlington—Arlington Co., Court House, street imprvs. in 1953, incl. paving, resurf., sidewalks, curb and gutter, large quantity of storm drainage. $2,000,000. C. G. Stoneburner, c/o owner, engr. CD 11/12/51.

▲ WASHINGTON—State Hy. Dpt., Olympia,
King Co.—new cutoff to Snoqualmie Pass Highway via Echo Lake to serve Tacoma, $7,000,000. W. A. Bugge, state hy. dir.

▲ WASHINGTON—State Hy. Dpt., Olympia,
Pierce Co.—imprv. Tacoma-Bremerton Hy. from Purdy north to Bethel, $1,000,000;
Whatcom Co.—access road to Western Wash. College of Education of Bellingham, $225,000. W. A. Bugge, state hy. dir.

AIRPORTS

▲ Calif., Oakland—AIRPORT—City, City Hall, $10,000,000 bond election Apr. 21, terminal bldg., $3,500,000; paving aprons and taxiways $3,500,000; extending East-West runway, $1,700,000; hy. to East-shore Freeway, $350,000; prepare hangar sites and misc. imprvs., $1,150,000, Oakland Municipal Airport. CD 12/1/48.

▲ † Mich., Selfridge Air Force Base—AIRBASE EXPANSION—U.S. Eng., 1900 Cadillac Tower, Detroit, air base expansion, incl. administration and training bldgs., hangar, parking ramp, warehouse, utility bldg. $1,550,000. CD 7/3/51.

LATIN AMERICA

▲ Guatemala, Guatemala City—Guatamalan Govt., Dpt. P. Wks., Guatemala City, plans hydro-electric plant. $5,000,000.

▲ Guatemala, Guatemala City—Guatamalan Govt., Dpt. P. Wks., Guatemala City, plans highway constr. program. $7,500,000.

▲ Peru—COPPER MINE, etc.—American Smelting & Refining Co., 19 Nassau St., New York 5, N. Y., U. S. A., copper mine and complete towers for employees in area below Lima, Approx. $100,000,000. Utah-Peru Co., 39 Broadway, New York 6, N. Y., U. S. A., engr.

PUBLIC BUILDINGS

▲ Calif., Bakersfield—HOSPITAL—Kern Co., Court House, plans by C. B. Alford & W. J. Thomas, Haberfeld Bldg., 5 story, 97,789 sq. ft., rein.-con., hospital, $3,000,000. Walker, Kalionzes, Klingermann, 488 S. Vincente St., Los Angeles, consult. engrs. CD 9/17.

▲ Calif., Norwalk—SCHOOL—Excelsior Union High School Dist., 15711 Pioneer Blvd., plans by Kistner, Wright & Wright, 816 W. 5 St., Los Angeles, 1 story frame, stucco artesia High School. $1,000,000. CD 2/21/50.

▲ **Calif., San Diego**—SCHOOLS— San Diego Unified School Dist., 825 Union St., $18,000,000 bond election Apr. 21, schools. CD 11/16/50.

▲ **Ill., Alton**—SCHOOLS, etc.—Alton Community School Dist., 151 Bd. Educ., J. B. Johnson, supt. Schools, Alton, voted $4,931,000 bonds, 8 schools and school addns., stadium. Albert M. Goedde, 1452 State St., East St. Louis, archt. CD 12/19.

▲ **Ill., Granite City**—SCHOOLS—Granite City Community Unit School Dist. No. 9, Paul A. Grigsby, Supt. Schools, Granite City, plans by Childs & Smith, 20 N. Wacker Dr., Chicago, Junior High School and addns. elementary schools and Community High School. $3,500,000. CD 2/2.

▲ **Ill., Highland**—SCHOOLS—Community Unit School Dist. No. 5, Floyd J. Tschanne, pres. Bd. Educ. Highland, voted $1,190,000 bonds, 3 schools and existing school addn.

▲ **Ind., Yorktown**—SCHOOL—Mt. Pleasant Twp., R. L. Miller, trustee, Yorktown, plans by Hamilton & Graham, 400 Western Reserve Bldg., Muncie, 2 story, brick stone Consolidated Two School, near here. $1,000,000. CD 1/4/46.

▲ **Kan., Wichita**—FIELD HOUSE and COMMUNITY CENTER—University of Wichita, 1845 Fairmount St., plans by Schmidt-McVay & Peddie, 1832 E. 2 St., field house and community center bldg. $1,670,000.

▲ **Mass., South Hadley**—SCHOOL—Town South Hadley, School Dpt., Crew St., South Hadley Falls, plans by Morris W. Maloney, 200 Dwight St., Springfield, Senior High School. $1,750,000. CD 12/13/49.

▲ **Mich., Ann Arbor**—SCHOOL—City, Bd. Educ., Ann Arbor, bond election Feb. 24, high school, 2 elementary schools, 2 school addns. $7,650,000 CD 4/28/49.

▲ **Mich., Kalamazoo**—AUDITORIUM and CLASSROOM—State, A. N. Langius, dir. State Bldg. Dpt., Lansing, brick, steel auditorium and classroom bldg., Western Michigan College of Education. $1,500,000.

▲ **Mo., Columbia**—MEDICAL SCHOOL, etc.—Curators of University of Missouri, Leslie Cowan, secy., Jesse Hall, medical school, $7,500,000; business and public administration bldg., $1,000,000; power plant, $850,000; Agricultural bldg., $750,000; arts bldg., equip., $500,000. CD 6/4/52 and 3/1/46.

▲ **Mo., Kansas City**—AUDITORIUM PARKING PROJECT etc.—City, c/o L. P. Cockingham, mgr., City Hall, plans by Gentry & Voskamp, 4 W. 13 St., Kansas City, Mo., municipal auditorium-Parking proj., 3 level underground garage surfaced by park 12 and 13 Sts., Wyandotte and Central Sts., $3,300,000.

▲† **Mo., St. Louis**—ORDNANCE PLANT—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., plans by Russell & Axon, engrs.-archts., 408 Olive St., addnl. facilities for St. Louis Ordnance Plant, incl. rehabilitation 3 addnl. units at small arms plant, 4300 Goodfellow Blvd. $13,000,000. CD 1/23.

▲ **Tex., Bryan**—ELECTRIC GENERATING PLANT—City, Bryan, (A) electric power generating plant unit. $1,000,000.

▲ **Tex., Gladewater**—SCHOOL—Gladewater Independent School Dist., c/o Supt., Gladewater, plans by Preston M. Geren, 1607 Fort Worth Natl. Bldg., Fort Worth, 1 story, 45,000 sq. ft. masonry, steel elementary school. $1,000,000.

▲ **Va., Fairfax**—SCHOOLS—Fairfax County School Bd., Fairfax, voted $11,000,000 bonds Feb. 3, 22 new schools and addns. to 21 present school bldgs. W. T. Woodson, c/o owner, Supt. Schools. CD 1/22.

▲ **Va., Fairfax**—HIGH SCHOOL—Fairfax County School Bd., Fairfax, plans by Robert A. Willgoos, 300 Montgomery St., Alexandria, Groveton High School, near Alexandria. $1,500,000. CD 6/6/50.

▲ **Va., Norfolk**—HIGH SCHOOL—Norfolk School Bd., Bank and Charlotte Sts., plans by Rudolph, Cooke & Van Leeuwen, Inc., 355 Monticello Arcade, Westmont Junior High School. $1,500,000.

▲ **Wash., Seattle**—OFFICE—State Dpt. P. Institutions, Old Capitol Bldg., 600 Washington St., Olympia, office. $2,500,000.

▲ **Wash., Steilacoom**—WARD—State Dpt. P. Institution, Olympia, plans by Lea, Pearson & Richards, Tacoma Bldg., Tacoma, women's ward bldg., Western State Hospital. $3,000,000. CD 6/17.

COMMERCIAL BUILDINGS

▲ **Ariz., Phoenix**—STORE—Goldwater's, 31 N. 1 St., Phoenix, plans by Welton Becket & Assocs., 5647 Wilshire Blvd., Los Angeles, Calif., 2 story store, Park Central Tract. $1,300,000.

▲ **Calif., Ukiah**—SHOPPING CENTER—Owner, c/o Bernard J. Sabaroff, archt., 1179 Market St., San Francisco, shopping center with parking facilities, 15-acre area. $2,000,000.

▲ **Fla., Orlando**—SHOPPING CENTER—Wellborn Phillips, Florida Bank Bldg., plans by Hugo Broleman, Jr., 1216 E. Colonial Dr., Azalea Park Shopping Center. $1,500,000.

▲ **Ga., Atlanta**—CATHEDRAL—Episcopal Diocese of Atlanta, 2744 Peachtree Rd., cathedral. $1,500,000.

▲ **Ind., Indianapolis**—HOSPITAL—Methodist Hospital, 16 St. and Capitol Ave., plans by D. A. Bohlen & Son, 930 State Life Bldg., 200-bed, 4 story, bsmnt., irregular, brick stone hospital addn. $2,000,000.

▲ **Ind., Indianapolis**—HOSPITAL—St. Francis Hospital, Churchman Ave., Beech Grove, plans by D. A. Bohlen & Son, 930 State Life Bldg., 300-room, 4 story, bsmnt., irregular, brick, stone hospital addn. $6,000,000.

▲ **Ky., Newport**—SHOPPING CENTER—Sanford Homes, Inc., 13470 Cedar St., Cleveland, O., shopping center incl. 27 stores, 1,500-cars parking area, Monmouth St. from 16 to 18 St. $2,500,000.

▲ **Md., Baltimore**—CATHEDRAL—Diocese of Baltimore, Chancery Office, 408 N. Charles St., plans by Maginnis & Walsh, 126 Newbury St., Boston, Mass., cut stone cathedral, $7,500,000. CD 10/10/49.

▲ **Mich., Alma**—HOSPITAL—Bd. Trustees, Gratiot Community Hospital, Alma, plans by Clark R. Ackley, 1811 E. Michigan St., Lansing, 2 story, bsmnt., brick, steel, concrete. R. B. Smith Memorial Hospital, $1,125,000. CD 11/19.

▲ **Mich., St. Clair Shores**—SHOPPING CENTER—Eugene Sloan, 16856 Schaefer St., Detroit, shopping center on 6 acre site, Stephens Hy. near Little Mack. $1,000,000.

▲ **Mich., Ypsilanti**—DORMITORIES, etc.—Cleary Business College, Ypsilanti, plans by R. S. Gerganoff, Ypsilanti, 2 dormitories, cafeteria, main classroom auditorium, admin. bldg., Washtenaw Rd. west of city limits, $2,000,000. CD 6/18/51.

▲ **N. Y., Huntington**—HOUSES and SHOPPING CENTER—Harry L. Osias, 233 Broadway, New York, Zone 7, 3,000 houses and shopping center, 1,000-acre tract, Northern State Parkway and Commack Rd. $30,000,000.

▲ **N. D., Fargo**—STORE and OFFICE—Land Co. Inc., Dr. W. L. Kostelechy, chn. Bd., 407 First Natl. Bank Bldg., store and office, 7 and Front Sts. $1,500,000.

▲ **O., Elyria**—SHOPPING CENTER—West River Land Co., 810 Marshall Bldg., Cleveland, Zone 14, plans by Sidney H. Morris & Assoc., 134 N. LaSalle St., Chicago, Ill., 29-unit shopping center, 35-acre site at intersection of new highway Rte. 57 and new Hy. Rte 254, Elyria and Sheffield Twps. $6,000,000.

▲ **Tex., Fort Worth**—STUDENT UNION—Texas Christian University, T. C. U. Campus, Fort Worth, plans by Preston M. Geren, 1607 Fort Worth Natl. Bank Bldg., student union. $1,000,000.

▲ **Tex., Houston**—SHOPPING CENTERS—Theodore W. Berenson & Ben G. McGuire, 837 Bankers Mortgage Bldg., plans by John Graham & Co., engrs.- archts., Dexter Horton Bldg., Seattle, Wash., Sect. 1, approx. 15-store space shopping center, $2,000,000; Sect. 2, approx. 10-store space shopping center, incl. one large suburban dept. store, $3,500,000; Sect. 3, approx. 25-store space shopping center, $2,250,000; Sect. 4, approx. 30-store space shopping center, $2,500,000, 45-acre tract off Gulf Freeway in the East End. CD 1/22.

▲ **Tex., San Antonio**—DWELLINGS—Gunnison Homes, Inc., New Albany, Ind., 175 prefabricated type dwellings, concrete slab fdn. $1,500,000.

▲ **Tex., Tyler**—OFFICE—Cotton Belt Route (St. Louis Southwestern Ry. Co.) W. H. Hudson, Jr., ch. engr., Tyler, 200x250 ft. office. $1,250,000.

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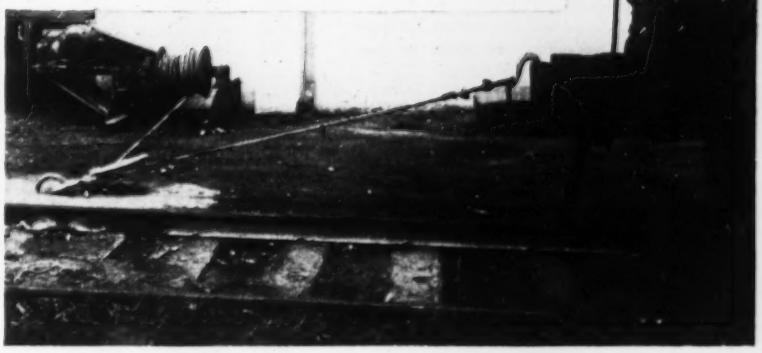

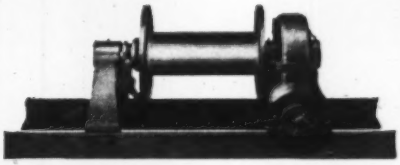

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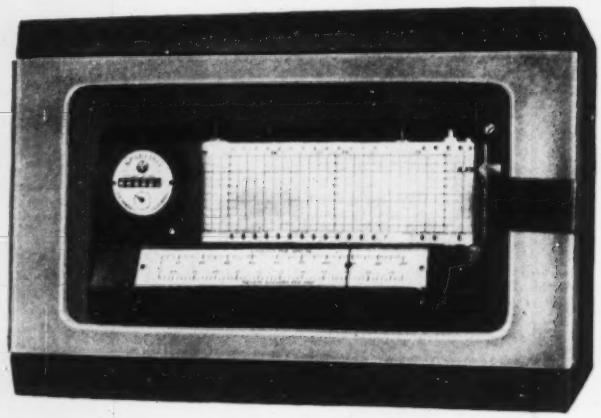

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KANSAS CITY 6.....6 East 11th St.

▲ **Va., Alexandria**—HOUSING—Michnick-Dimaid, 527 King St., plans by Joseph H. Saunders, Jr., 121 S. Columbus St., 1,200 row houses, Brookville Housing Development, 226 units, 2 story, brick, concrete masonry constr. $10,000,000.

▲ **Va., Arlington**—OFFICE—Roy Allman, 927 15th St. N.W., Wash., D. C., plans by Evan J. Conner, 927 15th St., N.W., Wash., D. C., 6 story office between Court House Rd. and 10th St. on Lee Blvd. $1,400,000.

▲ **Va., Quantico**—RESIDENCES—Westmont Homes, Inc., Jonathan Woodner Co., Ring Bldg., 1200 18th St. N.W., Wash., D. C., plans by Wallace F. Holliday, c/o owner, 250 row type pre-fabricated frame residences. $1,500,000.

▲ **Wis., Glendale (P.O. Milwaukee)**—SHOPPING CENTER—Bay Shore Centers, Inc., 4809 W. 27 St., Minneapolis, Minn., plans by M. O. Nathan, 343 S. Dearborn St., Chicago, Ill., shopping center. $5,000,000-$8,000,000.

▲ **Ont., Toronto**—OFFICE—Owner, c/o C. Wellington Smith, 602 Jane St., 12 story, bsmnt., office, Bay St. and Yorkville Ave. $1,500,000.

▲ **Ont., Toronto**—OFFICE—University-Richmond Realty Corp., c/o M. H. Lipton, 215 Victoria St., plans by Kaplan & Sprachman, 46 Yorkville Ave., 10 story, rein.-con., stone, glass, black granite base office, Richmond St. between University Ave. and Simcoe St. $2,500,000.

▲ **Que., St. Georges de Beauce**—SEMINARY—Seminary of St. Georges, St. Georges de Beauce, Que., plans by J. B. Gagnon, 327 Notre Dame St., Thetford Mines, 5 story, 50x165 ft., 3 story, 66x125 ft., concrete, steel, brick, stone seminary addns. $2,000,000. CD 10/5/50.

INDUSTRIAL BUILDINGS

▲ **Ill., Joppa**—GENERATING UNITS—Electric Energy, Inc., J. McAfee, pres., 315 N. 12 Blvd., St. Louis, 1, Mo., installing 2 addnl. generating units and necessary sub-station and transmission facilities to increase capacity from 500,000 kilowatts to 750,000 kilowatts. $52,000,000.

▲ **Tennessee**—ALUMINUM PLANTS—Wheland Co., 2800 Broad St., Chattanooga, 2 aluminum plants, one in coastal area and other in TVA area. Sites not selected. $70,000,000.

▲ **Tenn., Old Hickory**—PLANT—E. I. duPont de Nemours Co., du Pont Bldg., Wilmington, Del., Dacon Production Plant. Approx. $3,000,000.

▲ **Tex., Tyler**—PLANT—General Electric Corp., River Rd., Schenectady, manufacturing plant, $1,500,000; storage or warehousing, $200,000. Walter Kidde, 1205 Holman St., Houston, consult. engr. J. S. Newell, c/o owner, mgr. engr. and constr. Dpt. of Owners. CD 12/19.

▲ **N. S., Halifax**—WAREHOUSE—Simpson-Sears Ltd., 176 Yonge St., Toronto, Ont., 3 story 125,000 sq. ft. warehouse east of present mail order warehouse and 1 story buildings addns. $1,000,000.

UNCLASSIFIED

▲ **Calif., Edwards**—RAILROAD TRACK—Atchison, Topeka & Santa Fe Ry., L. H. Powell, ch. engr. (Coast Lines) 121 E. 6 St., Los Angeles, relocating 24.73 mi. railroad track from Boron to Sanborn, Kern Co. $7,000,000.

▲ **Md., Laurel**—CLUB HOUSE—Maryland State Fair, John D. Shapiro, pres., 313 E. Baltimore St., Baltimore, brick, concrete, steel, concrete block club house, Laurel Race Track. $2,000,000. CD 9/12/45.

▲ **Miss., Yazoo City**—ELECTRIC SYSTEM—City, electric sys. imprvs. $1,500,000. CD 12/7/51, under Public Buildings.

▲ **N. Y., Brooklyn**—PIER—Dpt. Marine & Aviation, Pier A, North River, New York, Zone 4, Proj. D-221, pier, foot of 36 St., piershed and bulkhead shed. $3,700,000.

▲ **Tenn., Paris**—GAS SYSTEM—City, natural gas sys. Approx. $1,000,000. Porter, Barry & Assoc., 1730 S. Main St., Baton Rouge, La., consult. engrs. CD 4/27/51.

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NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
March 18 Rhode Island
STREETS AND ROADS
March 3 Massachusetts

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **John Bowen Co., Inc.,** 171 Boston St., Dorchester, Mass. CA $15,198,375. HOUSING, Proj. Mass. 2-20, Columbia Point, Dorchester, BOSTON, MASS. Boston Housing Auth., 230 Congress St., Boston, Mass. CD 12/23, under LB.

▲ **Gellatly Constr. Co.,** 181 Sylvan Ave., Bridgeport, Conn., CA, $3,000,000 PLANT expansion, Bond St., BRIDGEPORT, CONN. General Electric Co., River Rd., Schenectady, N. Y. Bids Feb. 4. CD 2/3.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
March 3 Maryland
STREETS AND ROADS
March 3 Maryland March 10, 12 New Jersey
March 11 Delaware

▲ † **N. J., Wrightstown**—SEWAGE TREATMENT PLANT, etc.—B.A. 3/10—U. S. Eng., 121 N. Broad St., Phila. 1, Pa., sewage treatment plant, pumping station and paving, McGuire Air Force Base, ENG-36-109-53-241. $1,200,000. Extended date. Whitman, Requardt & Assocs., 1304 St. Paul St., Baltimore, Md., engrs. and archts. CD 2/4.

▲ † **N. J., Wrightstown**—FIRE STATION, etc.—B.A. 3/12—U. S. Eng., 121 N. Broad St., Phila. 1, Pa., fire station service club and chapel, McGuire Air Force Base, ENG-36-109-53-409. $1,000,000. Extended date. Fridy, Gauker, Truscott & Fridy, 1321 Arch St., Phila., Pa., archts. CD 2/4.

▲† **Md., Aberdeen Proving Ground**—AIRFIELD IMPRVS. —B.A. 3/17—U. S. Eng., 24 St. and Maryland Ave., Baltimore, airfield imprvs., exten. incl. paving, drainage and lighting. $3,000,000. Plans deposit $15. Whiteside, Foster, Damon & Deane, Inc., Pennsylvania R.R. Bldg., Wilmington, Del., engr. CD 2/17.

▲ † **N. J., Wrightstown**—SWITCHING STATION SUBSTATION, etc.—B.A. 3/19—U. S. Eng., 121 N. Broad St., Phila. 1, Pa., switching station substation, electrical distr. and street lighting system, McGuire Air Force Base, ENG-36-109-53-457. $1,500,000. Extended date. Whitman Requardt & Assocs., 1304 St. Paul St., Baltimore, Md., engrs. and archts. CD 2/11.

BIDS ASKED—BUILDINGS

▲ **Del., Wilmington**—HOSPITAL ADDNS., etc.—B.A. 3/3—The Memorial Hospital, 1501 Van Buren St., (from 3 previous low bidders) hospital addns., alterations, $3,500,000. Extended date. York & Sawyer, 101 Park Ave., New York, New York, N. Y., archts. CD 12/11.

▲ **Pa., Phila.**—HOUSING—B.A. 3/5—Phila. Housing Auth., 42 S. 15 St., Queen Anne Housing, Pulaski Ave., Queen Lane. $1,560,000. Roth & Fleisher, 1420 Walnut St., archts. Severud-Elstad-Krueger, 415 Lexington Ave., New York, N. Y., engrs. CD 10/6.

▲ **Pa., Corry**—HIGH SCHOOL—B.A. 3/10—Corry Joint School Auth., 203 N. Center St., Junior-Senior High School, $2,555,700. Plans deposit $25. Hunter, Caldwell & Campbell, 3601 Fifth Ave., Altoona, archts. CD 1/8/52.

▲† **N. J., Fort Monmouth**—LABORATORY—B.A. 3/17—U. S. Eng., 80 Lafayette St., New York 13, N. Y. Signal Corps Engineering Laboratory, (research and development), SERIAL NO. ENG 30-075-53-262, Phase II, $6,700,000. Plans deposit $80. Ballinger Co., 121 N. Broad St., Phila., Pa., archt. CD 4/2/51.

▲ **N. J., Belle Mead**—SHOP—B.A. 6/17—U. S. Eng., 80 Lafayette St., New York 13, N. Y., engineering maintenance shop, $1,000,000-$3,000,000. Erwin Gerber, 1180 Raymond Blvd., Newark, N. J., archts. CD 10/15.

▲† **N. J., Fort Monmouth**—HOSPITAL—B.A. After Sept. 1953—U. S. Eng., 80 Lafayette St., New York 13, N. Y. 200-bed hospital, $1,000,000-$3,000,000. Ziegler, Childs & Paulson, 921 Bergen Ave., Jersey City, engrs. CD 2/19.

▲† **Del., Newark**—PLANT—Bids Asked—Chrysler Corp., Newark, tank equipping plant and grading for Dpt. Army, Pentagon Bldg., Wash., D. C. $3,100,000. Albert Kahn Associated Architects & Engineers, Inc., New Center Bldg., Detroit, Mich., archt. and engr. CD 12/9.

SOON LETS CONTRACT—BUILDINGS

▲ **N. J., Camden**—RESIDENTIAL DEVELOPMENT—Robert C. Fallon, State Rd. and Pennsylvania R.R. Upper Darby, Pa., soon lets contract residential development, Fairview Ave. and Mt. Ephraim Ave. $3,600,000. Dante D'Anastasio, 1815 Federal St., Phila., Pa., archt.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **U. S. Eng.,** 80 Lafayette St., New York 13, N. Y. cancelled bids to have been opened Mar. 19, AFRTC facilities, at Niagara Falls Air Force Base, NIAGARA FALLS, N. Y. $1,000,000-$3,000,000. CD 12/11.

▲ **Thompson Constr. Corp.,** 8513 Widener Rd., Wyndmoor, Pa., LB, $1,053,607, track rehabilitation and new track paving, sidewalks and sewers, CAMDEN, N. J. Pennsylvania-Reading Seashore Lines, J. L. Gressit, ch. engr., Pennsylvania-Reading Seashore Lines Room 1658, Broad St., Station Bldg., 16 and Pennsylvania Blvd., Phila., 3, Pa. Bids Feb. 12. CD 1/30.

▲† **Construction Service Co.,** Bound Brook, N. J., LB, $1,598,760 avgas, jet fuel and lube oil facilities, McGuire Air Force Base, Eng 36-109-53-367 WRIGHTSTOWN, N. J. U. S. Eng., 121 N. Broad St., Phila., Pa. Bids Feb. 10. CD 1/22.

▲† **Arthur Venneri Co.,** 300 North Ave., East Westfield, N. J., CA, $1,454,174, regimental headquarters bldg., classrooms and storage bldgs., McGuire Air Force Base, ENG-36-109-53-341, WRIGHTSTOWN, N. J. U. S. Eng., 121 N. Broad St., Phila., 1 Pa. Bids Jan. 30. CD 2/5.

▲† **Lipsett, Inc.,** 210 S. 40 St., Phila., Pa., CA $1,480,112, aircraft maintenance shop and facilities, Naval Air Station, NOY 73198, Spec. 34377, WILLOW GROVE, PA. Dpt. Navy, Phila. Naval Base, Phila., Pa. Bids Jan. 27. CD 2/5 under LB.

▲† **Whiting Turner Contg. Co.,** National Marine Bank Bldg., Baltimore, Md., LB, $1,460,424, avgas and lube oil facilities, Dover Air Force Base, Eng. 36-109-53-366, DOVER, DEL. U. S. Eng., 121 N. Broad St., Phila., 1, Pa. Bids Feb. 10. CD 1/21.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Charles Guber, Leon Weiss & Theodore Leiber,** c/o Caleb Hornbostel, archt., 80 W. 40 St., New York 17, N. Y. Owner Builds. $2,500,000. 258 HOUSES, 40-acre tract, Jerusalem Ave., north of Hempstead Turnpike, HICKSVILLE, N. Y.

▲ **Dallas Homes,** c/o J. Herbert Burmeister, archt., 89-30, 161 St., Jamaica, N. Y. Owner Builds. $1,500,000. 100 HOUSES, on tract on 87 and 88 Sts. between 30 Ave. and Astoria Blvd., JACKSON HEIGHTS, N. Y.

▲ **Cauldwell-Wingate Co.,** 101 Park Ave., New York 17, N. Y., CA. Est. $5,000,000. 19 story OFFICE, Broadway and 40 St., NEW YORK, N. Y. M. Lowenstein & Sons, Inc., 43 Leonard St., New York 13, N. Y. Emery Roth & Sons, 575 Madison Ave., New York 22, N. Y., archts. CD 9/10.

▲ **Walsh Constr. Co.,** 122 E. 42 St., New York, N. Y., CA, $8,000,000, mfg. PLANT, water supply, sewage disposal system and paving, GIBBSTOWN, N. J. Hercules Powder Co., Delaware Trust Bldg., Wilmington, Del. M. W. Kellogg Co., 225 Broadway, New York, N. Y., engr. CD 5/22.

▲ **Alex Kessler,** 163-18 Jamaica Ave., Jamaica, N. Y., Separate Contracts, $12,000,000 RESIDENTIAL DEVELOPMENT, Klockner Rd., etc., TRENTON, N. J.

▲ **Amundsen Constr. Co.,** 4 W. Main St., Sheffield, Pa., CA. Est. $1,065,955, 1 story, 400x600 ft. brick, block HIGH SCHOOL, EMPORIUM, PA. Joint School Dist. of Emporium, Emporium, Pa. Bids Dec. 2. CD 12/16, under LB.

▲ **Niktone Co., Inc.,** West Chester Pike, Havertown, Pa. Separate Contracts. $1,560,000. RESIDENTIAL DEVELOPMENT, Ellis Ave. and Eagle Rd., HAVERTOWN, PA. Earl Wenge, McClatchy Bldg., Upper Darby, Pa., archt.

▲ **McCloskey & Co.,** 1620 W. Thompson St., Phila., Pa., CA. $5,966,000. Schuylkill Falls Low Rent HOUSING DEVELOPMENT, PHILA., PA. Phila. Housing Auth., 42 S. 15 St., Phila., Pa. CD 1/20, under LB.

▲ **S. Yellin & Son,** 222 N. 11 St., Phila., Pa., CA. $3,000,000. APARTMENT, 2101 Walnut St., PHILA., PA., 2101 Walnut Co-operative, Inc., 1426 Walnut St., Phila., Pa. CD 1/21.

▲ **John McShain,** 17th and Spring Garden Sts., Phila., Pa. LB $1,892,200, Morris E. Leeds Junior HIGH SCHOOL; LB $992,200, William Dick Elementary SCHOOL, PHILA. PA. Bd. Educ., 21 and Winter Sts., Phila., Pa. Bids Feb. 11. CD 2/5.

▲ **McCloskey & Co.,** 1620 W. Thompson St., Phila., Pa., CA. $1,065,977. GARAGE, 1021 Chestnut St., PHILA., PA. Phila. Parking Auth., Packard Bldg., Phila., Pa. Bids Oct. 28. CD 11/11, under LB.

▲ **Construction Service,** 2409 N. Broad St., Phila., Pa. LB $1,240,000. construct, manage, finance, 124 unit, Military HOUSING, WILLOW GROVE, PA. Dpt. Navy, Phila. Naval Base, Phila., Pa. W. Morton Keast, 1201 Chestnut St., Phila., Pa., archt. CD 2/5, under LB.

▲† **Five Boro Constr. Corp.,** 2 Lafayette St., New York, N. Y. LB $1,273,769. ACADEMIC BLDGS. alterations for classrooms, NOY 70047, Spec. 31673, ANNAPOLIS, MD. P. Wks. Office, U. S. Naval Academy, Annapolis, Md. Hall, Border & Donaldson, 2517 St. Paul St., Baltimore, Md., archts. J. L. Faisant & Assoc., 21 W. 25 St., Baltimore, Md., struct. engrs., Jas. K. Woolford, 2441 N. Charles St., Baltimore, Md., mech. engr. Bids Feb. 5. CD 1/9.

▲ **Victor Beauchamp,** 1837 Founrth St., Wash., D. C., CA $1,600,000. LABORATORY, SILVER SPRING, MD. Johns Hopkins University, Physics LABORATORY, 8621 Georgia Ave., Silver Spring, Md. Bids Jan. 14, awarded Feb. 16. CD 12/31.

▲ **Frank Scuderi,** 5817 Carlyl St., Cheverly, Md. CA Est. $18,000,000. APARTMENTS, semi-detached and single houses Branch Ave. and St. Barnabas Rd., near UPPER MARLBORO, MD. Marlow Heights, c/o contractor.

▲ **Andrews Constr. Co.,** Odessa, Del., Separate Contracts $2,500,000 RESIDENTIAL DEVELOPMENT, Capitol Trail, NEWARK, DEL.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
March 6 Kentucky
STREETS AND ROADS
March 6 Kentucky

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Blake Constr. Co.,** 33 "E" St., S. W., Wash. D. C., CA. $1,362,104. Springfield HIGH SCHOOL, Annandale, FAIRFAX, VA. Fairfax County School Bd., Fairfax, Va. Bids Feb. 12. CD 1/20.

▲ **Virginia Eng. Co., Inc.,** 29th St. at James River, Newport News, Va., CA. $2,680,000. Churchland and Great Bridge HIGH SCHOOLS, NORFOLK, VA. Norfolk County School Bd., 148 Granby St., Norfolk, Va. Bids Feb. 13. CD 1/15.

▲ **Cecil H. Mason Jr.,** 7 Bull St., Savannah, Ga., Owner Builds, $1,500,000, 166 RESIDENCES, Daffin Heights Subdivision, SAVANNAH, GA.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
March 3 Ohio March 10 Wisconsin
STREETS AND ROADS
March 3 Ohio March 10, 12 Wisconsin

▲ **Ill., Rantoul**—B.A. 3/11—Village, Village Hall Contract A, water mains; Contract B, elevated tank; Contract C, water plant; Contract D, sewage plant and Contr. E, sewers. $1,435,270. Plans deposit $25. Ernest Olsen, engr., Marr, Green & Oppert 3329 South Michigan Ave., Chicago 16, Ill. consultants.

SOON LETS CONTRACT—BUILDINGS

▲ **O., Dayton**—DORMITORY—Bd. Trustees, c/o Bus. Mgr. University of Dayton, 300 College Park St., Zone 9, soon lets contract 4 story ground floor, 43x204 ft., rein.-con. frame, masonry bldg. with two 43x79 ft. wings for mens dormitory to be known as Meyer-Zehler Hall. $1,320,000. Freeman & Pretzinger, 1155 Reibold Bldg., archts. CD 8/25.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Runck & McClure,** 5971 Belmont St., Cincinnati, O. Own Forces. $1,500,000. 150 one-family prefabricated DWELLINGS, Kirby Rd., north of Otte Ave., CINCINNATI, O. National Homes, Inc., Lafayette, Ind., archt. S. A. Ruebel & Co., Miles Rd., Cincinnati, O. engrs. CD 12/3.

▲ **Ohio Homes, Inc.,** 317 S. Reading Rd., Sharonville, O. Owner Builds. $1,320,000. 120 one-family prefabricated DWELLINGS off Wicklow Ave., Dillonville, CINCINNATI, O. National Homes, Inc., Lafayette, Ind., archt. James S. Wald, 8110 Woodbine St., Cincinnati, O., engr.

▲ **Fuller Constr. Co.,** Gardner Bldg., Toledo, O., CA. $3,000,000. 145 brick HOMES on 25-acre plot on west side of Byrne Rd. at Copland Blvd., TOLEDO, O. Paul J. Fuller, c/o contractor.

▲ **Reuter Home Builders, Inc.,** 1177 W. Grand Ave., Chicago, Ill., Owner Builds, $11,000,000, 638 HOME PROJECT, ARLINGTON HEIGHTS, ILL. Awarded Feb. 9. Vitzthum & Burns, 1 N. La Salle St., Chicago, 2, Ill. archts.

▲ **Douglas Constr. Co.,** 2724 W. Windsor St., Chicago, Ill., CA. $2,000,000, 250x850 ft., steel pipe MILL, DOLTON, ILL. International Rolling Mill Products Corp., 5000 Whipple St., Chicago, 9, Ill. Awarded Feb. 10. CD 10/2/48.

▲ **Wm. E. Schweitzer & Co.,** 2207 Dodge St., Evanston, Ill., CA. $1,493,925, HIGH SCHOOL GYMNASIUM, sewers and landscaping, NORTH CHICAGO, ILL. School District 133, 1605 N. Sheridan Rd., North Chicago, Ill. Bids Jan. 22, awarded Feb. 10. CD 12/30.

▲ **J. H. Findorff & Son, Inc.,** 601 W. Wilson St., Madison, Wis., CA. $1,494,398, general contract RECEIVING and INTENSIVE TREATMENT BLDG.;

Carl E. Mohs & Assocs., 2550 University Ave., Madison, Wis., CA. $715,000, general contract FOOD SERVICE BLDG.;

J. F. Ahern Co., Fond du Lac, Wis., CA. $367,000, plumbing and ventilating for food service and receiving and intensive treatment bldg., at STATE HOSPITAL, MENDOTA, WIS. State Dpt. P. Welfare, 128 S. State St., Capitol, Madison, Wis. Bids Dec. 30. CD 1/6, under LB.

▲ Miller-Davis Co., 1029 Portage St., Kalamazoo, Mich. CA Est. $3,500,000. Design, construct 235,000 sq. ft. tube PLANT and WAREHOUSE, KALAMAZOO, MICH. Hytron Radio & Electronics Co., (Div. Columbia Broadcasting System), 76 Lafayette St., Salem, Mass.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
March 6 Kansas, Minnesota
STREETS AND ROADS
March 6 Kansas, Minnesota

BIDS ASKED—BUILDINGS

▲ Tex., Beaumont—PLANT, etc.—Bids Asked—E. I. du-Pont de Nemours & Co., Orange, Tex., organic chemical plant, $4,000,000; warehousing or storage for chemical plant production, $200,000. CD 1/30.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ Woerman Constr. Co., 3800 West Pine Blvd., St. Louis 8, Mo. CA Est. $1,500,000. addn. to filter plant and pumping facilities, etc. at water works plant on Missouri River near Hog Hollowroad, ST. LOUIS COUNTY, MO. St. Louis County Water Co., Victor Weir, pres., 6600 Delmar Blvd., University City 5, Mo. CD 6/18/52.

▲† F. S. Oldt & C. E. Small, 403 S. Haskell St., Dallas, Tex., LB. $1,492,511, est. $1,250,000. maintenance hangar, Inv. No. Eng 41-443-53-37, Bergstrom Air Force Base, AUSTIN, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. Bids Feb. 12. CD 1/21.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
March 12, California
STREETS AND ROADS
March 11, 12 California

▲ California—B.A. 4/2—Oakdale Irrigation District, 322 East D St., Oakdale and South San Joaquin Irrigation Dist., 230 N. Main St., Manteca, Tri-Dam Project, involving dams, power plants, tunnels, etc. $50,000,000. Plans deposit $155. International Eng. Co., Inc., 74 N. Montgomery St., San Francicso, engr. for Beardsley Dam, Afterbay Dam and power plant and Tulloch Dam and power plant. Extended date. CD 2/9.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ Salt Lake Pipe Line Co., Box 117, Salt Lake City, Utah, CA, $4,000,000, 140 mi. 8 in., petroleum products pipe line from Pasco to Spokane, Franklin, Adams and Spokane Counties, WASHINGTON. Standard Oil Co. of California, 225 Bush St., San Francisco, Calif. CD 10/14.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Carson Park Mutual Homes No. 10, Box 8086 Long Beach, Calif., Owner Builds, $2,223,100, 273 stucco DWELLINGS in Kallon, Karen, Keynote Lees and Roxanne Sts., LAKEWOOD, CALIF. Paul J. Duncan, 13310 Moorpark St., Sherman Oaks archts.

▲† Ford J. Twaits-Morrison-Knudsen Co., Inc. & Macco Corp., 449 S. Beaudry St., Los Angeles, Calif., CA, $1,218,246, six 1 story, precast-concrete BARRACKS, NOY 74122, Spec. 35157, SAN DIEGO, CALIF. Eleventh Naval District, San Diego, Calif. Bids Jan. 20, awarded Feb. 9. CD 1/5.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Rex Heslop Homes Ltd., 7 Rexdale Dr., Islington, Ont., Owner Builds, $3,500,000. 400 DWELLINGS near Malton Road Highway, Islington, TORONTO, ONT. CD 12/11.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

▲† Alaska, Kodiak—UTILITY BLDG., etc.—B.A. 3/12—P. Wks. Officer, 17th Naval Dist., Kodiak, 30x45 ft. concrete utilities bldg., 1,850 ft. 6 and 10 in. waterline, 970 ft. 18 and 48 in. sewer outfall, electric sub-station, rehabilitate water tank and 2 water pumphouses, Naval Station, Spec. 31623. Bids Jan. 29 rejected, LB $2,786,000. CD 2/10, under LB.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† L. E. Baldwin, Inc., 1103 N. 36 St., Seattle 3, Wash. LB $5,886,500, est. $6,159,202, 47 two story, bsmnt. frame family quarters, from 705 to 1,250 sq. ft. each, Elmendorf Air Force Base, ENG-95-507-53-47, ALASKA. U. S. Eng., Evergreen Hall, 3013 Arcade Bldg., Seattle 1, Wash. Bids Feb. 13. CD 2/4.

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YES! Here's the scale that can be moved from job to job as a unit by merely removing six bolts which hold the side levers in place . . . It can also be installed as a pitless scale, saving expensive concrete pit - construction costs.

ACCURATE . . . perfectly balanced for "Lifetime-Accuracy." Wide steel bases, at both ends, support scale, therefore require no concrete footings. Easy-to read weighbeam is chrome-plated. Other vital parts are electro-plated against corrosion.

Capacities:
20, 25 & 30 Ton
Platform Lengths:
18, 22, 24 and 30 ft.

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Est. 1918

THURMAN MACHINE CO. 156 North Fifth Street Columbus, Ohio
Dept. A

Building costs stabilizing

Final '52 figures for weighted indexes show costs steady since third quarter—highway prices buck trend, still up

Building costs have stabilized after substantial increases in the second and third quarters of 1952.

That is the trend shown by weighted indexes of material and labor prices and by contractor indexes shown in the accompanying table.

ENGINEERING NEWS-RECORD's Construction Cost and Building Cost Indexes for 20 cities were the same in December, 1952, as in September. And, in the first two months of this year, they have shown no further changes.

Among other weighted indexes, the Boeckh index for five types of commercial and factory buildings was down slightly in December from the September figure.

The same was true of the Smith, Hinchman & Grylls index, which includes contractor overhead and profit. This index moved up a little in February, 1953, but still was under September, 1952.

Indexes that showed a 10% increase from September through December, 1952 were: American Appraisal Co. index, covering four types of buildings, excluding mechanical equipment and the Associated General Contractors index, covering construction materials and labor prices. However, in January, 1953, the AGC index dipped one point.

• **Agree on trend**—The contractor indexes were in complete agreement about the trend of costs in the final quarter of 1952. Only one of the five indexes showed an increase after the third quarter.

The Austin and Fruin-Colnon indexes for industrial building costs were exactly the same in December, 1952, as in September. The Aberthaw index, reflecting the trend of industrial buildings in New England, also was unchanged.

The Turner index for construction costs in Eastern cities was the same in January, 1953, as in October, 1952, while the Fuller indicator for commercial building costs was slightly higher in January than in September, 1952.

While building costs were stable, construct costs were not.

The contract unit price index for heavy construction in the Western U. S. as preported for the first time in ENR (see accompanying table) showed that costs were on a roller coaster in 1952—down sharply in the first six months and then back up to a new high the second half of the year.

That contrasted with the general firmness in costs in the nation as a whole in the first half of 1952, followed with a rapid rise in the third quarter. In another major area of construction—irrigation and hydropower work, construction costs moved on a plateau in the fourth quarter, following the general behavior of building costs. However, within the broad category of the Bureau of Reclamation's composite cost index, there were several diverse trends for different types of construction.

Prices bid on heavy construction in the Western States hit a new high in the second half of 1952, following a dip, during the first half of '52, in a two-year upward trend.

These bid prices trends come from the San Francisco District Heavy Construction Cost Index computed by the Estimates Section of the Army Corps of Engineers.

The new index value of 155.04 for the second half of 1952 is based on 100 for the first six months of 1946. The new reading is up 7.2% from the dip in the first half but is only 2.3% above the second half of 1951.

This index is an unweighted average of 26 elements of construction, each of which is an average of the three low bids on all projects of consequence for which unit prices are published in San Francisco, covering jobs west of Denver, Colo.

Of the 26 elements priced, nine set new high records in the second half of '52; another six reached their second highest values for the 1946-52 period and six moved against the trend—downward.

New highs were set for: road excavation; crushed rock base course; concrete pavement; cover aggregate; flat wheel rolling; 24-in. corrugated metal pipe; 6-in. cast iron pipe, sewer manholes and watering.

Items that reached their second highest values were: Plant mix asphalt; 2-in. galvanized steel pipe; 6-in. and 8-in. vitrified clay pipe; 8-in. cast iron pipe and 6-in. gate valves.

Prices went down on the following items: plant mix aggregates; timber in

CONTRACT UNIT PRICE INDEX

Western U. S.—Corps of Engineers, San Francisco

Jan.-June '46=100

1948	July-Dec.	133
1949	Jan.-June	132
	July-Dec.	124
1950	Jan.-June	112
	July-Dec.	126
1951	Jan.-June	142
	July-Dec.	152
1952	Jan.-June	145
	July-Dec.	155

BUILDING COST ROUNDUP

1913 = 100

		1952				1953	
Weighted	**Orig. base**	**Mar.**	**Jun.**	**Sept.**	**Dec.**	**Jan.**	**Feb.**
ENR construction	1913-100	551	562	586	587	587	587
ENR building	1913-100	407	413	424	425	425	425
American Appraisal* ..	1913-100	544	550	561	567	...	...
Assoc. Gen. Contractors	1913-100	378	382	394	399	398	...
Boeckh, U. S. average .	1926-29-100	422	430	437	436	...	...
Smith, Hinchman & Grylls*	1926-100	487	494	512	509	509	511
Contractor							
Aberthaw	1914-100	374	383	383	383	...	...
Austin	1926-100	338	340	344	344	...	...
Fruin-Colnon	1926-100	434	456	454	454	...	...
Fuller	1913-100	413†	413‡	421**	...	422	...
Turner	1913-100	489†	489‡	494**	...	494	...

* Corrects for productivity † April ‡ July ** October

IRRIGATION AND HYDRO-POWER CONSTRUCTION COST INDEXES

Bureau of Reclamation, Design & Construction, Div. Denver, Colo.

1949-51 = 100	1952 Jan.	1952 July	1952 Oct.	1953 Jan.
Composite index	1.10	1.12	1.13	1.13
Dams, earth	1.05	1.10	1.10	1.09
Dams, concrete	1.07	1.07	1.07	1.07
Pumping plants, bldg. and equip.	1.16	1.19	1.20	1.18
Structures, reinf. conc., and imprv.	1.10	1.15	1.16	1.17
Equipment	1.22	1.22	1.22	1.23
Pumps and prime movers	1.22	1.22	1.23	1.28
Accessory electric and misc. equip.	1.18	1.18	1.18	1.12
Discharge pipes	1.17	1.19	1.21	1.21
Canals	1.11	1.16	1.18	1.18
Conduits, tunnels, free flow conc. lined	1.08	1.15	1.15	1.13
Laterals and drains	1.10	1.12	1.12	1.14
Primary roads	1.11	1.13	1.15	1.14
Secondary roads, unsurfaced	1.14	1.14	1.16	1.18
Bridges	1.12	1.15	1.17	1.19
Power plants, hydro, bldg. and equip.	1.16	1.19	1.20	1.21
Structures, reinf. conc., and imprv.	1.12	1.16	1.16	1.17
Equipment	1.20	1.20	1.21	1.23
Turbines and generators	1.22	1.22	1.24	1.27
Accessory electrical equip.	1.20	1.20	1.21	1.15
Misc. equip.	1.13	1.13	1.13	1.15
Penstocks	1.17	1.19	1.21	1.21
Transmission switchyards and substations	1.08	1.10	1.11	1.11
Transmission lines, wood pole	1.11	1.13	1.13	1.11
Transmission lines, steel tower	1.13	1.13	1.14	1.14
Permanent gen'l property, bldgs.	1.15	1.15	1.15	1.14

place; structural concrete; 36-in. reinforced concrete pipe and furnishing both treated and green wood piling.

Irrigation and hydro-power bid prices are up an average of 3% for the 12 months that ended Jan. 31, 1953, according to the Bureau of Reclamation Index. The index was 1.13 for January, based on 1949-51 average equals 1.00.

Two-thirds of the price increase came in the first six months. The balance of the rise came in the third quarter. The index leveled off in the final quarter.

All but a few of the 25 sub indexes in the composite index were higher in January, 1953, than they were in January, 1952.

Exceptions were: electrical accessory equipment for pumping, down 5%, and for hydro-power plants, down 4%; permanent general property buildings, down 1%; wood pole transmission lines and concrete dam costs, both of which were back to the same level as in January, 1952.

Indexes that were higher in January, 1953, than in January, 1952, included: earth dams, canals and conduits. Pumping plant buildings and equipment reached a high point in October, then declined. That was due to a drop in electrical accessory equipment prices between October and January. The decline was partially offset by a sharp rise in bid prices for pumps and prime movers and further increases in the cost of structures and improvements.

Hydro-power plant costs crept steadily higher during the year. Increased cost of structures and improvements, and a boost in the cost of penstock, turbines and generators, more than offset the dip in electrical accessory equipment.

The Bureau of Reclamation has changed the bases for these indexes, to the three-year period 1949-51. The old base (ENR Sept. 4, 1952, p. 103) was January, 1940. The Bureau's indexes are based on combined unit prices of materials and labor, including that supplied by the government, on actual jobs.

HIGHWAY PRICE INDEX, COMPOSITE STANDARD MILE

U. S. Bu of Public Roads, 1925-29=100

1952	1Q	2Q	3Q	4Q	Av.
Composite	169.1	171.8	174.9	176.0	173.0
Excavation, common	116.0	118.5	121.1	113.4	117.3
Pavement, concrete	185.3	188.0	189.4	199.7	190.6
Structures	242.5	245.5	255.4	247.7	247.8
Quantity and bid prices used					
Excavation, common, 17,491 cu yd	$.041	$0.42	$0.43	$0.40	$0.41
Pavement, concrete, 3,726 sq yd	4.11	4.17	4.20	4.43	4.23
Structures:					
Reinforcing steel, 16,000 lb	0.123	0.122	0.126	0.126	0.124
Structural steel, 4,325 lb	0.184	0.175	0.195	0.191	0.186
Structural concrete, 68 cu yd	52.97	54.80	56.55	53.69	54.50

NOTE: For previous values see Sept. 4, 1952 ENR, p. 107

• **Trouble Spot Seen**—With the construction industry looking anxiously for continued stabilization of costs, one trouble spot is appearing on the horizon for 1953. Highway costs did not join in the fourth-quarter leveling-off. They climbed steadily all through 1952.

Even a drop in contract prices for excavation and structures failed to stop the advance in costs shown by the Bureau of Public Roads' composite mile cost index for federal-aid highway construction.

Highway bid prices went up almost as much in 1952 as in 1951, according to the figures that are listed in the Bureau of Public Roads, Composite Mile Index.

In this index, which rose 6% during the year, unit prices actually bid on federal-aid highway contracts are averaged and weighted as shown in the accompanying table.

Concrete pavement prices advanced the most. They were successfully higher in each quarter for a total 8% rise between '51 and '52.

For both excavation and structures, bid prices moved to a peak in the third quarter. Then both dropped back in the fourth quarter to end the year 4% higher than in the fourth quarter of 1951.

Garden State Parkway to stay within original cost estimates

New Jersey Highway Authority denies charges that toll road will exceed $285-million cost approved by voters

The New Jersey Highway Authority, already beset by a court suit that has blocked sale of its bonds (ENR Feb. 12, p. 62), last week faced more troubles from critics of the proposed $285-million Garden State Parkway.

Groups opposing the parkway ran newspaper ads charging the parkway is going to cost far more than the $285 million originally estimated. They contended that the bond issue approved by the voters of New Jersey last November would not be big enough to pay for the proposed superhighway.

Ransford J. Abbott, state highway commissioner, who is also a member of the Highway Authority, immediately denied the report. Commissioner Abbott declared:

"Recent conferences with engineers disclose that the parkway can be built as originally planned for $285 million."

Abbott also denied another report that center safety islands would be cut from 300 ft to 200 ft wide to keep within the budget. He said that traffic lanes would be brought closer together only at locations where the parkway crosses large streams or where property values are considered exceptionally high.

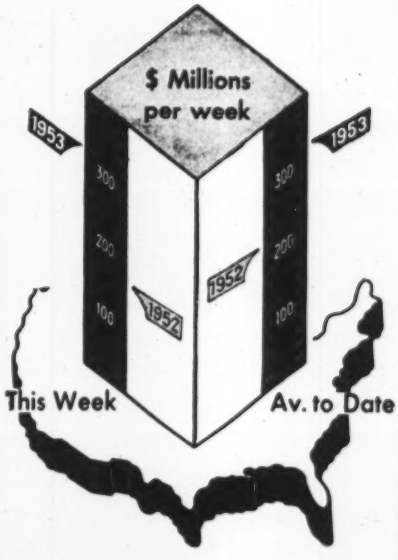
• **Construction timetable**—The Highway Authority's construction timetable now calls for four lanes from the northern terminus to Toms River, N. J., and two lanes from Toms River to Cape May, N. J., to be completed by Jan. 1, 1954. Two additional lanes from Toms River to Cape May are scheduled for completion by June 1, 1954.

The schedule is contingent on a favorable ruling in New Jersey Superior Court proceedings where constitutionality of the bond issue is being tested. Permanent financing cannot be completed until the court suit is settled.

Availability of steel is another factor that could alter the timetable. Approximately 85,000 tons of fabricated steel will be needed for the 371 bridges along the parkway route. Assurances of 45,000 tons have been obtained. Efforts are being made to get the other 40,000 tons in the second quarter of this year.

Activity This Week

As reported to ENR
(in millions of dollars)



Contracts by type of work

	This Week	Cumulative 9 wks 1953	1952	% chge
Waterworks	$3.2	$36.0	$45.4	−21
Sewerage	7.0	69.2	32.4	+114
Bridges	7.0	77.1	40.4	+91
Highways	13.7	188.8	165.7	+14
Earthwork, waterways	1.6	67.9	65.2	+4
Buildings:				
Public	34.4	311.3	253.6	+23
Housg., pub.	24.6	156.7	131.8	+19
Housg.,priv.	110.4	784.7	447.1	+75
Commercial	20.1	159.9	69.2	+131
Industrial	67.6	760.6	495.8	+53
Unclassified	33.1	297.3	238.6	+25
Total	**$322.7**	**$2,909.5**	**$1,985.2**	**+46**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR indexes		Base Year = 100 1913	1926	1949
Constr. cost.	Feb.	587.19	282.26	123.09
	Jan.	587.27	282.30	123.11
Bldg. cost.	Feb.	425.24	229.87	120.88
	Jan.	425.04	229.76	120.82
Volume	Jan.	714	290	206

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OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10:30 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY. SEND ALL ADVERTISEMENTS TO CLASSIFIED ADVERTISING DIVISION, 29TH FLOOR, McGRAW-HILL PUB. CO., INC., 330 W. 42 ST., N. Y. 36, N. Y.

Bids: March 5, 1953

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 5th day of March 1953, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. NICKERSON, District Engineer, 353 Broadway, Albany, New York				
Albany	C.T. 53-4 C.T. 53-3P S.T.C. 53-9 S.T. 53-10	N.Y.S. Thruway—Catskill Section Sub. 3A & 4 (Delaware Ave.-Normanskill); Southern Blvd. Interchange; Frisbie Avenue Ext.; McCarthy Avenue; Marginal Road "J"	(Thy. 2.20) (Acc. 1.65)	9" Com. Conc. Pavt. 2 @ 25' Var. Wide=3.06 Mi. T.C. Bit. Mac.=0.76 Mi. F.C. Gravel=0.03 Mi. 2 Gr. Sep. Alpha I-Beams 91' and 154.6'	$104,000 Plans $25	$1,923,000
Albany & Schenectady	M.T. 53-3 S.T. 53-7 R.C. 53-19	N.Y.S. Thruway—Mohawk Section Subs. 1 and 2 (Gordon Rd.-Albany Co. Line); Co. Rd. 32R; Co. Rd. 26R; Co. Rd. 24R; Mariaville Rd. Conn.; Co. Rd. 9R; Co. Rd. 7R; South Schenectady-Mariaville S.H.788; Schenectady-Duanesburg Pt. 1, S.H.880; Schenectady-Guilderland S.H.577	(Thy. 6.542) (Acc. 3.432)	9" Cen. Conc. Pavt. 2 @ 25' Var. Wide=7.827 Mi. Bit. Mac. Ty. 1=0.473 Mi. Asp. Conc. Ty. 1A, Opt.=1.614 Mi. Misc. Work=0.06 Mi. 7 Gr. Sep. Alpha I-Beam 232.6'; 213.9'; 218.7'; 186.5'; 216.9'; 193' & 190.3'; 1 Br. Conc. Closed Box 24'	300,000 Plans $100	5,227,000
Warren & Washington	FASSH 53-8	Harriscena-Fort Ann Pt. 1, 2A & 2B Proj. S-36 (3)	4.65	Bit. Mac. Opt. Rd. Mix Conc. Twin Box 20' R.C. Arch Deck 46.5'	28,000 Plans $15	500,000
		DISTRICT No. 2				
		LACY KETCHUM, District Engineer, 109 Genesee St., Utica, New York				
Montgomery	M.T. 53-4 S.T. 53-8 R.C. 53-21	N.Y.S. Thruway—Mohawk Section Subd. 12D & 13A (Fort Plain-Randall); Canajoharie Interchange; 6 Access Drives; Fort Plain-Canajoharie, Canajoharie-Fultonville, Pt. 1 S.H.8348 Canajoharie-Fultonville Pt. 2, S.H.8371	(Thy. 10.40) (Acc. 3.33)	9" Cem. Conc. Pavt. 2 @ 25' Var. Wide=12.86 Mi. Asp. Conc. Ty. 1A, Opt=0.48 Mi. Found Crse. Gravel=0.39 Mi. 3 Gr. Seps. Alpha I-Beams 121'; 132'; and 201' 4 Brs. Alpha I-Beams 262'; 374.2' 164' and 149' 1 Br. R.C. Twin Box 34'	520,000 Plans $100	9,481,000
		DISTRICT No. 3				
		WM. ROBINSON, District Engineer, Weigh Lock Building, Syracuse, New York				
Onondaga	O.T. 53-2	N.Y.S. Thruway—Ontario Section Sub. 8A (Mattydale Interchange)	2.70	9" Cem. Conc. Pavt. Var. Wide=2.58 Mi. Found. Crse. Gravel=0.03 Mi. Misc. Work=0.09 Mi. 3 Gr. Seps. Alpha I-Beams 207.1'; 170'; and 215.5'	75,000 Plans $25	1,394,000
Oswego	FAGC 53-4 FAC 53-5 FARC 53-14	Separation of Grades Oswego City: State Road and N.Y. O. & W. R.R. Oswego City; State Road Oswego-Mexico Pt. 1, S.H.509 Proj. U-UG 486(3)	1.37	9" Cem. Conc. Pavt. 24'-42' Wide=1.32 Mi. Asp. Conc. Ty. 1A, Opt.=0.05 Mi. R.R. Sep. Rigid Frame 40'	28,000 Plans $10	496,000
		DISTRICT No. 4				
		E. G. YOUNGMANN, District Engineer, Barge Canal Terminal, Rochester, New York				
Monroe	FAC 53-3P FASH 53-4P	Rochester City: Mt. Read Blvd. FAC 50-5 Mt. Read Blvd.-Lake Ontario State Parkway Pt. 1, FASH50-4 Proj. U-UG 1093(2)	4.18	Asp. Conc. Ty. 2A=4.09 Mi. Misc. Work=0.09 Mi. 1 Gr. Sep. (RR) R.C. Rigid Frame 61' 1 Gr. Sep. (RR) Plate Girder 128' 2 Gr. Seps. (Hy.) Alpha I-Beams 133' & 178'	$110,000 Plans $50	2,035,000
		DISTRICT No. 5				
		C. R. WATERS, District Engineer, 65 Court St., Buffalo, New York				
Erie	R.C. 53-20	Collins-Mortons Corners, Pt. 1, S.H.526	0.04	Misc. Work (Replace Exist. R.C. Slab Culvert)	2,800 Plans $10	50,000
		DISTRICT No. 6				
		JAMES H. THOMAS, District Engineer, State Office Building, Hornell, New York				
Chemung	PSC 5987 FASH 53-5 FASH 53-6 FARC 53-16	Elim. Gr. Cross of Chemung and Sayre Sts. with Penn. RR Horseheads-Corning S.H.358 Horseheads Village, S.H. 5162; Horseheads Village East Corning-Horseheads, Pt. 2 Proj. U-661(3)	3.22	Asp. Conc. Ty. 1A, Opt.=2.47 Mi. (Hy.) Asp. Conc. Ty. 1A, Opt.=0.72 Mi. (Acc.) Misc. Work=0.03 Mi. R.R. Sep. R.C. Rigid Frame 44'	70,000 Plans $15	1,307,000
		DISTRICT No. 8				
		J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, New York				
Orange	FASH 53-7 FARC 53-17	Palisades Interstate Park-Goshen, Pt. 3 (Chester-Goshen); Chester-Florida S.H.1809; Chester-Goshen S.H.156; Goshen Village; S. Church, W. Main Sts. and Greenwich Ave., S.H.1329 and 4 Access Roads Proj. FI-1050(5)	4.59 Hy. 1.64 Acc.	9" Com. Conc. Pavt. 2 @ 25' Var. Wide=4.17 Mi. Asp. Conc. Ty. 1A, Opt.=0.82 Mi. Found. Crse. Gravel=1.18 Mi. Misc. Work=0.06 Mi. 1 Gr. Sep. R.C. Rigid Frame 45.4' 2 Gr. Sep. Alpha I-Beam 212', 207.8' 1 Br. Twin R.C. Box 40.3'	$190,000 Plans $50	3,374,000
		DISTRICT No. 9				
		F. W. DONOVAN, District Engineer, 71 Frederick Street, Binghamton, New York				
Broome	FARC 53-18	Binghamton-Windsor, Pt. 2 S.H. 5022 Proj. U-344(19)	2.67	9" Cem. Conc. Pavt. 2 @ 25' Wide Ext. 48.09' I-Beam	90,000 Plans $15	1,648,000
Delaware	FASSH 53-3	Cadosia-Granton Proj. S-147(2)	3.58	Bit. Mac.=3.54 Mi. Misc. Work=0.04 Mi.	30,000 Plans $15	550,000
		DISTRICT No. 10				
		J. J. DARCY, District Engineer, Montauk Highway, at Little East Neck Road, Babylon, L. I., New York				
Nassau	PSC 7276	Elimination of L.I.R.R. Gr. Cross. with Centre Ave., Village Ave. and Park Ave. Village of Rockville Center	0.25	Viaduct Lighting	$600 Plans $10	10,000
Suffolk	FARC 53-4 FASH 53-2	Maywood-Babylon, S.H.1841 Maywood-Babylon, Part 2 Babylon Village, S.H. 5299 Proj. U-985(7), U-874(4)	2.53	9" Cem. Conc. Pavt. 2 @ 25', 50' Wide=1.30 Mi. Asp. Conc. Ty. 1A, Opt.=1.05 Mi. Misc. Work=0.18 Mi.	58,000 Plans $15	1,059,000
Suffolk	B.P. 53-50	Moriches Inlet (West Side)	....	Stone Jetty (Beach Protection)	5% of Bid Plans $10	552,050

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: March 20, 1953

City of Ashtabula, Ohio Sewage Treatment Plant

The City of Ashtabula, Ohio will receive sealed Proposals for the construction of a Sewage Treatment Plant until 11:00 A.M. (Eastern Standard Time) on the 20th day of March, 1953 at the office of the City Manager, City Hall, Ashtabula, Ohio.

All Proposals received will be publicly opened and read aloud in the Council Chambers at the City Hall at Ashtabula, Ohio at 11:00 A.M., E.S.T., on Friday March 20, 1953.

The contract document including plans and specifications are on file and available for inspection at the office of the City Engineer of the City of Ashtabula at Ashtabula, Ohio.

Copies of documents including plans and specifications required for review or bidding purposes may be obtained only from the City Engineer by depositing $25.00 with the City Engineer for each set of documents so obtained.

The full amount of the deposit for one set of documents and one-half of the deposit for any additional sets of documents will be refunded to each bidder who submits a formal proposal to the City and who also returns the plans (and specifications on additional sets) in good condition to the City Engineer within ten (10) days after his bid security has been returned to him.

Equipment manufacturers, sub-contractors, and others who do not submit formal proposals to the City will be refunded one-half (½) the amount of the deposit for all sets of complete documents including plans and specifications returned in good condition to the City Engineer within ten (10) days after the opening of bids. No refund will be made for documents received by the City Engineer after this ten (10) day period.

A certified check or bank draft drawn on a solvent bank payable without condition to the City Treasurer of Ashtabula, Ohio, in an amount not less than five percent (5%) of the bid shall be submitted with each Proposal, as a guarantee that if the Proposal is accepted, a contract will be entered into and the performance of the contract properly secured.

No bid shall be withdrawn after the opening of Proposals without the consent of the City of Ashtabula for a period of Thirty (30) days after the scheduled time of closing bids.

The City of Ashtabula reserves the right to reject any or all Proposals and to waive any informalities or irregularities in the bids received, and to accept any Proposal which is deemed most favorable to the City of Ashtabula, at the time and under conditions stipulated in the Instructions To Bidders.

The successful bidder will be required to furnish a satisfactory Performance Bond in the sum of the full amount of the contract.

In general, the improvement on which Proposals are requested will require construction of a sewage treatment plant of the partial treatment type, incorporating chemical treatment facilities and separate sludge digestion, with sludge filtering equipment for a nominal design sewage flow of 12 million gallons per day. Project also includes certain modifications in existing buildings and structures on the site.

Plans and specifications for this Project were prepared by Consoer, Townsend & Associates, Consulting Engineers, 351 East Ohio Street, Chicago 11, Illinois.

Dated at Ashtabula, Ohio
this 11th day of February, 1953.

DENNIS F. DUNLAVY,
City Manager

Bids: March 24, 1953

Detroit River Bulkhead on Harbor Line Extension

MH-13B AD. 1

MEMORIAL HALL COMMISSION
CITY OF DETROIT, MICHIGAN
CONTRACT MH-13B

THE CONSTRUCTION OF THIS PROJECT HAS BEEN AUTHORIZED AND AN ALLOTMENT OF CONTROLLED MATERIALS AND RATING FOR OTHER MATERIALS APPROVED BY THE NATIONAL PRODUCTION AUTHORITY ON DECEMBER 31, 1952.

Sealed proposals for a bulkhead, located in the Detroit River between Third Avenue and Shelby Street, addressed to the CITY ENGINEER'S OFFICE, DEPARTMENT OF PUBLIC WORKS, of the City of Detroit, and endorsed: "Proposal for Contract MH-13B" will be received at the OFFICE OF THE CITY ENGINEER, 30TH FLOOR, GUARDIAN BUILDING, DETROIT 26, MICHIGAN, until 2:00 P.M., City of Detroit Time, on March 24, 1953, at which time they will be publicly opened and read aloud. Any proposal received after the abovementioned time will be returned to the bidder unopened.

The work included consists of furnishing all labor and materials for the construction of steel, cellular type bulkhead or seawall, approximately one-third mile long, on the extended harbor line. The cells are approximately 31 feet wide by 40 feet long, constructed of 65 foot long steel sheeting, and are to be filled with gravel or stone.

The Contract Documents, including notice to Bidders, Form of Proposal and Agreement, Drawings and Specifications may be examined at the office of the City Engineer, during business hours and copies may be obtained by making a deposit of $10.00 per set, which sum will be refunded upon the return in good condition of the complete set of Contract Documents within ten days after receipt of proposals, or if used in submitting a bona fide proposal.

Each proposal shall be accompanied by a certified check or a satisfactory bidder's bond in an amount of not less than 5 percent of the total bid price, as security for the acceptance of the Contract.

All checks shall be made payable to the Treasurer, City of Detroit.

After the scheduled closing time for receipt of bids, no proposal may be withdrawn for at least 45 days.

The City of Detroit reserves the right to waive any informality in any bid, or to accept any bid, or to reject any or all bids, should it be deemed for its best interests so to do.

CITY OF DETROIT
FRANK G. SCHEDMANSKE, President
Memorial Hall Commission
G. R. THOMPSON
City Engineer

Bids: March 5, 1953

Construction of Concrete Bridge Decks

DELAWARE RIVER
JOINT TOLL BRIDGE COMMISSION
ADMINISTRATION BUILDING
MORRISVILLE, PENNSYLVANIA
NOTICE TO CONTRACTORS

Sealed proposals for the construction of reinforced concrete bridge decks for three (3) structural steel highway bridges, over the Delaware River, between Pennsylvania and New Jersey will be received by the Delaware River Joint Toll Bridge Commission at its office, Administration Building, Morrisville, Pennsylvania, until eleven o'clock (11:00) A.M., Eastern Standard Time, on the 5th day of March 1953, at which time and place all bids will be publicly opened and read aloud.

After February 13, 1953, Instructions to Bidders, form of Proposal, form of Contract, form of Performance Bond, Plans and Specifications may be examined at the office of the Commission, above address, and copies thereof obtained upon payment of $10.00 for each set, which amount is not returnable.

The names, location and approximate quantities of major items for the three bridges are as follows:

Contract No. 103 Delaware Water Gap Bridge, between Delaware Water Gap, Pennsylvania and Warren County, New Jersey.

Concrete	3,400 C.Y.
Lightweight Concrete	435 C.Y.
Three-way Tile Duct	4,850 L.F.
Placing Reinforcing Steel	934,000 Lbs.

Contract No. 203 Portland-Columbia Bridge, between Portland, Pennsylvania and Columbia, New Jersey.

Concrete	915 C.Y.
Lightweight Concrete	120 C.Y.
Three-way Tile Duct	1,300 L.F.
Placing Reinforcing Steel	250,000 Lbs.

Contract No. 303 Milford-Montague Bridge, between Milford, Pennsylvania and Montague, New Jersey.

Concrete	1,000 C.Y.
Placing Reinforcing Steel	277,000 Lbs.

Proposals may be submitted for the deck for each bridge separately, for two bridges combined or for all three bridges combined.

Each Proposal must be accompanied by a certified check in the amount of not less than five (5) percent of the amount of the Proposal.

If the bidder submits Proposals for more than one contract, a single certified check in the amount of not less than five (5) percent of the largest amount of work included in a combination of proposals, will be sufficient.

All checks shall be made payable to the Delaware River Joint Toll Bridge Commission, which amounts shall be forfeited as liquidated damages if the bidder or bidders fail, within ten (10) consecutive calendar days after written notice that the bidder or bidders have been awarded the contract, to enter into a written contract with the Commission in accordance with the accepted bid, and to give a Performance Bond satisfactory to the Commission, equal to one hundred percent (100%) of total amount of contract.

The Commission reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work, and to the bidder whose proposal is deemed by the Commission to be most advantageous to the public interest.

DELAWARE RIVER JOINT
TOLL BRIDGE COMMISSION
by Alexander R. Miller
Chairman of Commission

Date February 13, 1953

Bids: March 18, 1953

Dickson-Carbondale Pipeline

SCRANTON-SPRING BROOK WATER SERVICE CO.
INVITATION TO BIDDERS

Proposals will be received for the construction of a 8.1 mile steel gas pipeline 8" in diameter along the streets, alleys, and highways of the various municipal subdivisions between Dickson City and Carbondale, Lackawanna County, Pennsylvania, until 1 P.M., Wednesday, March 18, 1953.

Proposals shall be addressed to the above company at 30 North Frankin Street, Wilkes-Barre, Pennsylvania, and be enclosed in a sealed envelope.

A bid bond or certified check in the amount of $20,000 shall be presented with each proposal in a separate envelope, marked "Bid Bond", as surety for the execution of a contract awarded to the successful bidder.

The proposal forms, plans, contract documents and specifications may be secured at the office of the company at 135 Jefferson Avenue, Scranton, Pennsylvania, or by written request, at a cost of $25.00 per set. This deposit will be returned upon return of the plans and specifications in good order within 10 days after the bid opening.

Bids: March 12, 1953

THE PORT OF NEW YORK AUTHORITY

Installation of Pipe Railing Shields

PORT AUTHORITY BUS TERMINAL
Contract O & M—177
Proposal No. 34

Sealed proposals for furnishing all labor, material, and equipment to install Pipe Railing Shields at the Port Authority Bus Terminal, Suburban Bus level, 40th and 41st Streets, between 8th and 9th Avenues, New York, N. Y., will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111 - 8th Ave., New York 11, until 11:00 A.M., Thursday, March 12, 1953, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3892) will be received at Huron, South Dakota, until March 18, 1953, for furnishing labor and materials for stringing conductors and overhead ground wires, Ft. Randall-Sioux City 230-kilovolt transmission line, Transmission Division, South Dakota, Missouri River Basin Project. Location: Between Ft. Randall, South Dakota, and Sioux City, Iowa. Principal items are: Furnishing and stringing three 795,000 circular mil conductors, 114 miles; furnishing and stringing two ½-inch steel overhead ground wires, 121 miles; stringing three 795,000 circular mil conductors, 6.6 miles; and other work. Completion time 180 days. For particulars, address Bureau of Reclamation, Huron, South Dakota; or Building 53, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner

OFFICIAL PROPOSALS

Bids: March 18, 1953

Construction of Additions to Sewage Treatment Plant

OFFICE OF THE MAYOR, CITY OF LIMA, OHIO

Contract No 33 - P - 414 January 31, 1953

Sealed proposals will be received by the Mayor of the City of Lima, Allen County, Ohio, at his office in the City Building until 12 o'clock noon, Eastern Standard Time, on Wednesday, March 18, 1953, and then publicly opened and read for the construction of additions to and modifications of the Sewage Treatment Plant of the City of Lima, Allen County, Ohio.

The work will consist principally of:

Remodeling the existing inlet diversion chamber; laying a new inlet sewer; constructing a screen chamber; detritor basin, screen, and detritor building, two (2) primary sedimentation tanks, storm water overflow, venturi pit, excess sludge thickener; three (3) aeration tanks, one (1) final sedimentation tank, chlorine contact tank, chlorination building, one (1) digester, digestion control building and sludge beds; installing mechanical equipment, connecting piping, electrical facilities, flow measuring devices, pumps, blowers, and heating and ventilating equipment; remodeling the primary sludge handling and pumping facilities; the return activated sludge handling and pumping facilities, the aeration tanks, the final sedimentation tanks, the outlet control chamber and the sludge digestion facilities, and the furnishing and installing of auxiliary equipment and piping, all in accordance with the Plans and Specifications.

Plans and pamphlet containing the Contract Documents consisting of Invitation and Information for Bidders, blank form for Bid or Proposal, form of Contract, and Specifications for the work are on file in the office of the Mayor at the City Building, Lima, Allen County, Ohio, and at the office of the Engineer, Alfred B. Anderson, 990 Broad Street, Newark 2, New Jersey, and may be inspected by prospective bidders during office hours.

The successful bidder will be required to pay the minimum wage rate established by the Department of Industrial Relations of the State of Ohio. No bidder may withdraw his proposal for a period of thirty (30) days after the date of the opening of the bids.

Plans and contract documents may be obtained at either location upon the deposit of $25.00 for each set. The deposit will be refunded if the documents are returned in good condition not later than fifteen (15) days after the award of the contract.

All bids shall be made on the blank form provided in the Contract Documents.

A certified check upon a solvent bank or satisfactory bid bond in the amount of five percent (5%), of the total bid made payable to the order of the City of Lima, Ohio, shall accompany the Proposal, but in a separate envelope. Said check or bond to be a guarantee that if the proposal is accepted a contract will be entered into and the performance of it properly secured as required.

Terms of Proposal and Sureties required are fixed by the Contract Documents.

The contract will be awarded to the lowest and best Bidder, but the right is reserved by the Mayor to reject any and all bids or to waive any informalities in favor of the City.

By direction of the Council of the City of Lima, Ohio.

Stanley A. Welker
Mayor City of Lima, Ohio

Bids: March 10, 1953

Route 35, Section 1-A

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Route 35, Section 1-A, Intersection Improvement at Sylvania Avenue and Laird Avenue, Borough of Neptune City, Monmouth County. Length 0.166 mile. The principal items of construction are: Estimated:

Roadway Items
610 cu. yds. Roadway Excav.—Earth
1,110 sq. yds. 9" Rein. Conc. Pavement Surface
740 lin. ft. White Concrete Curbs
Electrical Items
1,650 lin. ft. Under Roadway Conduit
350 lin. ft. Underground Conduit
20 Junction Boxes
9 Detector Installations

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, March 10, 1953, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten per cent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: March 18, 1953

Substructure of Sakonnet River Bridge

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ADMINISTRATION
DIVISION OF PURCHASES
NOTICE TO BRIDGE CONTRACTORS

Sealed Proposals addressed to the Division of Purchases and enclosed in an envelope endorsed "Proposal for the construction of the substructure of Sakonnet River Bridge," will be received by the Division of Purchases at the office of the State Purchasing Agent, Room 123 State House, Smith St., Providence, R. I. until 11.30 A.M. on the eigateenth day of March, 1953, at which time they will be opened and read in public.

R. I. Contract No. 5351, County of Newport, towns of Portsmouth and Tiverton, Sakonnet River Bridge No. 250 over the Sakonnet River. This project consists of the completion of all foundations between and including the west and east abutments of the main structure and its ramps, including deep water and land construction, and involving 5,997 cu. yds. of wet excavation, 3,751 cu. yds. of earth excavation 1,863 tons of steel H-piling, 10,972 cu. yds. of reinforced concrete, 6,938 cu. yds. of tremie concrete and 13,050 cu. ft. of granite facing.

Bids for the above work must be made on blanks furnished by the Department of Public Works, Division of Roads and Bridges. Plans and specifications and Special Provisions may be examined at Room 123 State House, or Room 232 State Office Building, Providence, R. I., on and after February 16, 1953 every week day except Saturdays and holidays, between the hours of 8:30 A.M. and 4:30 P.M. Blanks for submitting proposals may be obtained through the office of the State Purchasing Agent at 123 State House. A deposit of $50.00 shall be made for each set of contract documents, which deposit will be refunded if plans and specifications are returned in good condition within two weeks after the opening of bids.

A certified check or bid bond payable to the State of Rhode Island, or cash, in the amount of $55,000.000 must be furnished by each bidder, which proposal guaranty will be returned after the contract has been executed, unless forfeited in accordance with the stipulation in the proposal.

A performance bond of one hundred per cent (100%) of the contract price with a satisfactory surety company will be required of the successful bidder. The Division of Purchases reserves the right to reject any or all bids.

EMPLOYMENT LISTS: A local employment service has been designated by the R. I. Employment service to prepare the employment lists for this project. Request for men to be employed on this project shall be submitted to the District Office, 284 Thames St., New port, R. I.

WAGES OF LABOR: In conformity with the provisions of Chapters 290 and 291, General Laws, 1938, the minimum wages for a day's work paid craftsmen, teamsters and laborers shall not be less than the customary and prevailing rate of wages for a day's work in the same trade or occupation in the locality where the work is undertaken. Such a schedule of wages has been established on a minimum hourly basis, and is on file in the office of the State Department of Labor. The Contractor shall pay not less than these minimum wage rates.

SUBLETTING OR ASSIGNING THE CONTRACT: The attention of bidders is directed to the Standards and/or Special Provisions covering subletting or assigning the contract.

DEPARTMENT OF ADMINISTRATION,
DIVISION OF PURCHASES
By Franklyn A. Adams,
State Purchasing Agent

Bids: March 17, 1953

Metalclad Switchgear for Switch House No. 2

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-260.004

Sealed proposals for the furnishing and installation of metalclad switchgear in Switch House No. 2 at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, March 17, 1953, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1110, and copies will be furnished upon deposit of $25.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, February 26, 1953.

U. S. Government

Sealed bids will be received in the office of the Engineering and Construction Director, The Panama Canal, Balboa Heights, Canal Zone, until 10:00 A.M. Eastern Standard Time, April 15, 1953, for furnishing all plant, tools, equipment, materials, labor, and services and performing all work for the preparation of sites and construction of utilities, pavements, and buildings for Cardenas Townsite, Cardenas, Canal Zone. Sixty-six masonry type quarters buildings, one telephone exchange and one electrical substation are included in this project.

Copies of plans and specifications may be obtained from the Panama Canal Company, 24 State Street, New York 4, N. Y. Requests should be accompanied by a $40.00 deposit for each set, the deposit to be in the form of a United States money order or certified check payable to "Treasurer, Panama Canal Company." The plans and specifications may be inspected at the following places:

The Panama Canal, 101 Indiana Ave. N. W., Washington 25, D. C.

Office of the District Engineer, U. S. Engineer's Office, 4735 East Marginal Way, Seattle 4, Washington.

Office of the District Engineer, U. S. Engineer's Office, 751 S. Figueroa Street, Los Angeles 55, California.

Office of the District Engineer, U. S. Engineer's Office, P. O. Box 1538, Albuquerque, New Mexico.

Office of the Division Engineer, U. S. Engineer's Office, Southwestern Division, 1114 Commerce Street, Dallas, Texas.

The Panama Canal, 24 State Street, New York 4, N. Y.

Office of the District Engineer, U. S. Engineer's Office, 180 New Montgomery Street, San Francisco 19, California.

Office of the District Engineer, U. S. Engineer's Office, 1709 Jackson Street, Omaha 2, Nebraska.

Office of the District Engineer, U. S. Engineer's Office, Foot of Prytania Street, New Orleans, La.

OFFICIAL PROPOSALS

Bids: April 8, 1953

Waterworks Improvements

ADVERTISEMENT FOR BIDS
for
City of Logansport, Indiana

Sealed proposals for constructing waterworks improvements in the City of Logansport, Indiana, and in accordance with the plans and specifications now on file in the Office of the Clerk-Treasurer of said City, addressed to the Board of Public Works and Safety of the City of Logansport, Indiana, and endorsed "Proposal for Waterworks Improvements," will be received at the Office of the Clerk-Treasurer, City Hall, Logansport, Indiana, until 1:30 P.M. Central Standard Time, April 8, 1953.

The work proposed will be in four sections or contracts as follows:

CONTRACT NO. 1—Water Mains.
CONTRACT NO. 2—Elevated Water Storage Tanks and Reservoirs.
CONTRACT NO. 3—Booster Pump Station and Foundations for Storage Tanks and Reservoirs.
CONTRACT NO. 4—Water Treatment Plant and Low Service Pump Station.

Bidders may take out plans and specifications and submit proposals on any one or all contracts or any combination of contracts.

Each proopsal must be made out and submitted on the forms provided and shall be accompanied by a certified check on a solvent bank in Cass County, Indiana, drawn payable to the "Clerk-Treasurer of the City of Logansport, Indiana," in an amount equal to ten per cent (10%) of the total price bid, to be forfeited to the City of Logansport, Indiana, as liquidated damages in case of failure on the part of the successful bidder to execute the contract and furnish satisfactory surety bond within ten (10) days after acceptance of the proposal by the City of Logansport, Indiana. In lieu of a certified check bidders may furnish a bid bond, which bid bond shall be in the form prescribed by the State Board of Accounts of Indiana. Bids bond form may be obtained from the "Clerk-Treasurer" or the "Engineer."

Standard questionnaires and financial statement of the form prescribed by the State Board of Accounts of Indiana shall be filed with each proposal.

Plans and specifications will be available for distribution on March 2, 1953. Plans, specifications, proposal form, contract form, and questionnaires and financial statement forms may be obtained at the office of the Clerk-Treasurer, City Hall, Logansport, Indiana, or from Alfred LeFeber & Associates, Consulting Engineers, 2933 Woodburn Avenue, Cincinnati 6, Ohio, upon deposit of $25.00 for Contract No. 1; $25.00 for Contract No. 2; $25.00 for Contract No. 3 and $35.00 for Contract No. 4. Ten Dollars ($10.00) of the deposit made on each contract will be refunded upon the return of the plans and specifications in good condition within thirty (30) days from the date of receipt of proposals.

February 25, 1953.

CITY OF LOGANSPORT, INDIANA
By and Through Its
Board of Public Works and Safety

Bids: March 10, 1953

Electrical Work, Highway Lighting & Sign

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

RT. 4 PARKWAY (1927), SECTIONS 6, 7, 8 & 9

Route 4 Parkway (1927), Sections 6, 7, 8 & 9, Garden State Parkway (1953), Electrical Work, Highway Lighting & Sign, from Centennial Avenue to Morris Avenue, Cranford Township, Borough of Kenilworth and Union Township, Union County.

Estimated:
25,000 lin. ft. Trenching & Backfill
45,000 lin. ft. Primary Cable, 7500 Volts
1—Channel letter Sign & Structure, Complete
150—Lighting Standards
1,500 lin. ft. Wrought Iron Conduits
4,000 lin. ft. Secondary Cable, 600 Volts

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, March 10, 1953, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten per cent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: March 10, 1953

Readvertisement

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ALLAMUCHY-HACKETTSTOWN ROAD

Construction of a portion of Allamuchy-Hackettstown Road from end of existing concrete running southerly toward Hackettsown, in Allamuchy Township, Warren County, Federal Aid Secondary Project No. S-7(4). Length 0.435 mile. The principal items of construction are:

Estimated:
1,758 cu. yds. Roadway Excav.-Unclassified
852 cu. yds. Subbase
5,101 sq. yds. 8" Plain Concrete Pavement

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, March 10, 1953, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements, and by P. L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 18 E. Blackwell Street, Dover, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work, are on file in the office of the State Higway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: March 18, 1953

Readv. of State Project #810-24-27

NOTICE TO CONTRACTORS: Sealed proposals (Readv. State Project No. 810-24-27) will be received by the Louisiana Department of Highways, Baton Rouge until 11:00 A.M. on Wednesday, March 18, 1953, and publicly opened and publicly read for the REMOVAL OF PORTIONS OF OLD CALCASIEU RIVER BRIDGE AT LAKE CHARLES, CALCASIEU PARISH. Length: 0.120 mile. Full information, proposal forms, plans ($4.00) and specifications are available at Room 307, Department of Highways, Baton Rouge, Louisiana.

GEORGE S. COVERT, Director

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3890) will be received at Arapahoe, Nebraska, until 10 a.m., CST, March 10, 1953, for furnishing labor and materials for Bartley Diversion Dam, Red Willow Unit, Frenchman-Cambridge Division, Missouri River Basin Project. Location: Approximately 2 miles southeast of Indianola, Nebraska. Principal items are: Excavation, 88,900 cu. yds.; compacting embankments and foundations, 40,800 cu. yds.; concrete, 5,100 cu. yds.; furnishing and driving steel sheet piling, 1,051,000 pounds; furnishing and installing 4 radial gates, lump sum; and other work. Completion time 420 days. For particulars, address Bureau of Reclamation, Arapahoe, Nebraska; or Building 53, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner

GOVERNMENT OF THE DISTRICT OF COLUMBIA, DIRECTOR OF HIGHWAYS, D. C., February 26, 1953. SEALED PROPOSALS will be received in Room 404, Library Building, 499 Pennsylvania Ave., N.W., Washington 1, D.C., until 2:00 P.M., April 2, 1953, EASTERN STANDARD TIME, and then publicly opened and read for constructing A BRIDGE OVER KINGMAN LAKE AND ANACOSTIA RIVER ON EAST CAPITOL STREET EXTENSION. The bridge will consist of fifteen (15) plate girder spans of approximately one hundred twenty feet (120') each for six (6) lanes of traffic with reinforced concrete floor and reinforced concrete abutments and piers on steel piles. Approximate quantities of major items are: 13,730 cubic yards excavation, 51,830 lineal feet steel H piles, 3,760 cubic yards tremie concrete, 6,500 cubic yards substructure concrete, 4,800 cubic yards superstructure concrete, 1,700,000 pounds reinforcing steel, 3,875,000 pounds structural silicon steel, 4,100,000 pounds structural carbon steel and 4,060 lineal feet of handrail. Bids will be received for three (3) alternates involving either the entire structure, the substructure only, or the superstructure only. Proposal forms, plans and specifications may be obtained from the Secretary, Contract Board, D.C., Room 406, Library Building, 499 Pennsylvania Avenue, N.W., Washington 1, D.C., by general contractors only, upon deposit of a certified check for each set, made payable to the Collector of Taxes, D. C., in the amount of FIFTY DOLLARS ($50.00). Telephone NAtional 8-6000, Extension 2378.

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NEW ADVERTISEMENTS: Address New York City Office, 330 W. 42nd St., N. Y. 36, for March 12th issue closing March 2nd.

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A qualified applicant should

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b) know inert-gas welding and equipment.
c) have a thorough knowledge pertaining to the welding of API and ASME code vessels and pressure piping codes.
d) have shop fabrication inspection experience.
e) have experience in training and qualifying code welders.

Excellent salary, advancement and security. Travel is required. Outstanding opportunity with leading, progressive and expanding firm of engineers-constructors in petro-chem field with domestic and international activities.

Interviews arranged in New York at our expense. Arrangements for relocation of immediate families of selected applicants to NYC area.

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An Alert Mechanical Engineer with Some Knowledge of Electrical Engineering . . . Must Be a Good Calculator . . .

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Aggressive, imaginative, fast-moving organizer to handle asphalt resurfacing, concrete roads and storm sewer systems. Excellent opportunity for experienced man. Top salary and bonus.
P-6363, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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Experienced
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For work on the New Jersey Garden State Parkway. Salary Open. Send outline of experience. Apply F. E. Harley & Associates, P.O. Box 113, Route 23A, 1¼ miles south of Main Street, Matawan, New Jersey.
Matawan 1-3366 or Matawan 1-3369

WANTED:
Marine Construction Superintendent
Age 35 to 40, C.E. Degree, with at least ten years experience in heavy construction such as bridge foundations, breakwaters, piers and docks. Must have had considerable time in full charge of projects. Permanent position. Salary $6500 to $7500 with Life Insurance, Hospitalization and Retirement Benefits. Location Middle West.
P-6815, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED
General Asphalt Paving Superintendent
Excellent opportunity for experienced man in Asphalt Resurfacing and General Road Construction work.
Southern Connecticut Area. State Age and Qualifications. Reply to
P-6976, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

ASSISTANT CITY Engineer. Needed by Illinois City with extensive construction program. Must be experienced in survey, design and construction supervision of concrete paving and sewer and water main. Furnish complete data as to qualifications, education, experience and salary requirements. P-6849, Engineering News-Record.

ASSISTANT CHIEF Engineer, large construction company seeks Assistant Chief Engineer capable of assuming full responsibility for major construction projects. Must be licensed professional engineer with demonstrated administrative ability. Salary $15,000. P-6965, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT by well established and expanding contractor in Southern Michigan (not Detroit). Experience on schools, industrial, commercial and monumental buildings desirable. Give outline of education, experience, salary expected, and inclose snapshot if available. Write P-6877, Engineering News-Record.

MALE HELP Wanted. Project Manager for large industrial building job in East Tennessee. Permanent position and excellent opportunity with young and growing company. Reply stating fully experience, availability, salary requirements, to Post Office Box 1144, Montgomery, Alabama.

MEDIUM SIZED structural steel fabricator, Pittsburgh area, desires the services of a competent Engineer to take charge of Construction Department. Must be familiar with structural erection methods, costs and labor relations. Write P-6947, Engineering News-Record.

SUPERINTENDENT—NATIONALLY known construction company, requires experienced superintendent in foundation and water work. Reply giving full particulars as to age, experience and salary expected. Intrusion-Prepakt, Inc., 779 Union Commerce Bldg., Cleveland 14, Ohio.

SALEMAN WANTED in Upper Peninsula of Michigan. Experience preferred in earthmoving and construction equipment sales. Send all particulars and qualifications, photograph optional. Brebner Machinery Co., Inc., Marquette, Michigan.

STRUCTURAL STEEL Estimator. Must be experienced in take-off, extending, and pricing. State age, experience, references, and salary expected. Permanent position, excellent opportunity. Pascoe Steel & Construction Company, Box 1368, Pomona, California.

SURVEYOR EXPERIENCED in property and subdivision surveys. Work near Northport. John B. Blydenburgh, N.Y.S. 25-A, Northport, N. Y.

WANTED
Experienced Scaffolding SALES ENGINEER
for field work with a young aggressive company. Age 28 to 35 with at least 4 or more years experience in selling and engineering scaffolding job layouts. A wonderful opportunity for the right man.
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3565 Wooddale Ave. Minneapolis, Minn.

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DRAFTSMAN WANTED—Experienced for detailing miscellaneous and/or structural steel by Bushnell Steel Company, P. O. Box 2529, Jacksonville, Florida. Reply giving brief resume of experience, education, availability, and salary expected.

ENGINEERS EXPERIENCED in water and sewage works projects or related fields. Opportunity for permanent connection with long established consulting firm. Please state full qualifications, experience, references and salary requirements. Location Ohio. P-6733, Engineering News-Record.

ESTIMATOR ON building construction for long established firm. Our organization aware of this ad. Replies held in confidence. Write care of P. O. Box 26, Everett, Mass. State experience and salary requisites.

EMPLOYMENT SERVICE

WANTED-ENGINEERS. Designers, Draftsmen, Structural, Piping, M.E., C.E., E.E. and Industrial, also Teaching and Chemists. Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

C.E. GRADUATE with 2 years experience in building construction supervision. Some experience in sewer and waterline design and installation. Desires job with contractor engaged in large project. Write PW-6591, Engineering News-Record, Chicago, Illinois.

BUILDING CONSTRUCTION Executive thoroughly experienced estimating, buying subcontracts, materials, etc., solicitation of new business and field management. PW-6926, Engineering News-Record.

CIVIL ENGINEER, graduate, age 31 with 10 years of experience including cost engineering, inspection work, sewer and water line construction, and engineering administrative work. Minimum salary requirements $48.00. Will relocate. PW-6972, Engineering News-Record.

CONSTRUCTION ESTIMATOR, Office Engineer, 18 years experience on residential, commercial, heavy industrial, and institutional buildings, familiar with subcontracts and purchasing, age 41, married, architectural trained, now employed, desires permanent connection. PW-6927, Engineering News-Record.

EXPERIENCED C.E., all phases general contracting in N.Y.C. desires position with building contractor. Further details by interview. PW-6867, Engineering News-Record.

(Continued on page 72)

AVAILABLE
Construction Manager with long successful record in charge of estimating, bidding, and supervision of all types of Heavy Construction Projects—in particular Sewage Disposal and Water Filtration Plants—desires permanent connection. Best of references.
PW-6703, Engineering News-Record
330 West 42 St., New York 36, N. Y.

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Openings in Cleveland and other various offices offering good salaries with long term employment opportunities for qualified personnel in the following categories

Structural—Engineers and designers experienced in structural steel and reinforced concrete design on industrial and commercial buildings

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Architectural—Architects and architectural designers experienced in industrial and commercial building design

Estimating—Estimators experienced in industrial and commercial buildings and mechanical installations

Specifications—Specifications writers experienced in writing specifications for industrial and commercial buildings

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These positions offer excellent working conditions with paid vacations, sick leave and participating group insurance program. Most locations are working scheduled 5 day 45 hour work week with overtime after 40 hours.

Replies will be treated confidential and arrangements will be made to interview selected applicants. Please submit complete resume stating experience, education, salary required and date available to

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Must have experience in dealing with engineers, general contractors, and sub-contractors—ability to promote and develop sales in the Industrial and Commercial building material field. Must know trade terminology of this field and be experienced in channels of distribution. We prefer man with at least five years' experience, capable of operating with a minimum of management supervision. This is an excellent opportunity to become associated with an expanding, internationally-known company.

Reynolds Metals Company
Parts Division

Send complete resumé to C. B. Greasman, Personnel Director, 2000 South Ninth, Louisville, Kentucky.

EXECUTIVE ELECTRICAL ENGINEER

Position presently open with heavy industrial electrical contracting firm. Work highly competitive and nation-wide in scope, with headquarters in San Francisco Bay Area. Age 35 ot 50. Must have at least 15 years experience in electrical estimating and heavy construction, and with at least 5 years in a managerial capacity. Send complete details on qualifications, experience, references and salary requirements to:

P-6804, Engineering News-Record
68 Post St., San Francisco 4, Calif.

SPECIFICATION WRITERS and ESTIMATORS

Architectural and mechanical. Experience on industrial, commercial and institutional work desired. Give age, education, detailed experience record, references and salary expected.

P-6865, Engineering News-Record
330 W. 42nd Street, New York 36, N. Y.

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wanted by

STANDARD OIL COMPANY (*Indiana*)

Mechanical, civil, and *chemical engineers* are needed for design and inspection work at Standard Oil Company's largest refinery located near Chicago.

Continuing expansion of facilities and technological advances create openings for qualified engineers. Recent graduates are desired, and are offered an opportunity to work and advance with one of the leading companies in an industry noted for its engineering achievements.

Engineering staff is permanent, with excellent opportunities for advancement and also promotional outlets to other departments of the Company. Positions are well paying and outstanding employee benefit plans are provided.

The interesting variety of work includes inspection of existing oil refining units and of new facilities; also the design, construction, development and servicing of all types of oil refinery equipment. This includes power plants and distribution systems, water supply and waste disposal facilities, structures, buildings, heat exchangers, piping, fractionating and other process equipment used in the development and distribution of petroleum products.

Reply by letter, giving complete summary of education and experience and stating salary expected. All applications will be carefully considered and kept strictly confidential.

STANDARD

ADDRESS: Mr. P. L. Krauel
Chief Engineer, Whiting Refinery
Standard Oil Company
2400 New York Avenue, Whiting, Indiana

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ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-third year. Write today.
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College House Offices - HARVARD SQUARE, CAMBRIDGE, MASS.

POSITIONS WANTED

(Continued from page 70)

MECHANICAL ENGINEER, fully qualified (B. Sc. Scotland). Age 39. Oil, Chemical and Industrial Plant, layout and installation exp. Desires post in U.S.A. in order to join family. PW-6976, Engineering News-Record.

CIVIL-STRUCTURAL Engineer: 20 years. Municipal, industrial, commercial buildings; highways, bridges, special structures. Planning, supervision of design and construction, public relations and promotion. Engineering organization manager for 8 years. PW-6851, Engineering News-Record.

ENGINEERING EXECUTIVE, North American, graduate U. S. Naval Academy (Annapolis) 1935, PG at MIT; extended experience in management, mechanical and electrical design, sales engineering, residential design, and construction. Six years in Venezuela; speaks Spanish fluently. Age 39, married with three children. Position in South America preferred but interested in all. PW-6681, Engineering News-Record.

ENGINEERING MANAGER background in complete Plant Design, preparation and analysis of budgets for industrial installations. Bulk of experience in detergents, Pharmaceuticals and organic chemicals. PW-6457, Engineering News-Record.

EXECUTIVE ENGINEER, P.E., N. Y. State and others, 50, experienced administration engineering projects, Chemicals, petroleum, rubber, hydro-electric plants. Structural hydraulic, mechanical, industrial and related problems. Design, construction. Past affiliations consulting and industrial. Salary over $12,000. Available April. PW-6820, Engineering News-Record.

SEWER CONSTRUCTION Foreman, with 20 years of know how acquired on difficult Sanitary and storm sewer projects, desires position with someone who appreciates speed and quality of production. PW-6850, Engineering News-Record.

SANITARY ENGINEERING Designer, extensive experience treatment plant design including 7 years overseas. Available, now, prefer U. S. Location. PW-6916, Engineering News-Record.

MINING ENGINEER, graduate. Five years mining, 10 yrs. highways, railroad & control surveys, geodetic and astronomical computations. Want responsible position mining or surveying nature. Presently employed but seeking better position. PW-6922, Engineering News-Record.

REGISTERED ENGINEER: Age 34. Experienced in all Phases of Architectural, Structural and Municipal Engineering. Desirous of relocating in South or S.W. with firm offering good opportunity or possible association. PW-6980, Engineering News-Record.

STRUCTURAL ENGINEER, age 50, thorough supervisory experience with large consulting and construction organizations on power plants, chemical plants, large industrials, airfields, waterfront structures, dams, bridges, etc. Excellent estimator, spec writer. Desires permanent responsible position. Salary range $8,000 to $10,000. PW-6971, Engineering News-Record.

SUPERINTENDENT OR Assistant to General Superintendent. 20 years heavy construction. Excavation, drainage and paving. Know men, methods, equipment and cost. Available April 1st. PW-6973, Engineering News-Record.

SUPERINTENDENT-CONTRACT manager, building construction, industrial, commercial or housing. Capable of producing competitive costs. Earnings past 15 years $15,000 to $20,000. PW-6967, Engineering News-Record.

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CONSTRUCTION MANAGER or Project Manager available March 15th. Over 25 years diversified experience as Construction Manager and Project Manager on foreign and domestic work. Outstanding record in dams, power plants, hydro and thermal, water front work, air bases etc. as well as over-all management, supervising all departments of jobs. Highest references. PW-6789, Engineering News-Record.

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Design, Drafting, Estimating, and Procurement work wanted in the Structural, Industrial, and Chemical Plant Project Field by a New Engineering Organization. Thoroughly experienced men. The J. H. Frank Engineers, P.O. Box 383, Anniston, Alabama.

WANTED

Want structural, mechanical, plant layout, tooling, civil or any combination of these. Approximately 300 man hours per week available. Registered in Indiana, Michigan and Ohio. WW-6773, Engineering News-Record.

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FS-6937, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

1—836—Utility Gradation Control Unit Serial 836-5-6 Eng. #E128973
1—833—Dryer—Serial 833-1-20D Engine #152412
1—21'-6" C enclosed elevator
1—Fines Hopper & Feeder
1—842 Mixer—Serial 842-3-6 Engine HP326, Buda
Above equipment located near Baltimore.
FS-6945, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

FOR LEASE WITH OPTION TO PURCHASE
15 Bottom Dump Euclid Trucks
Model 38-FDT, 15 c.y., used 2,500 hours. Will lease for 6 months, rental to apply on Purchase Price of $16,000.00 each. Rubber is 80% of new condition—Trucks located at Garrison Dam, Riverdale, North Dakota—Telephone Riverdale 8191—Mr. Dale Watson, or Los Angeles, NEvada 62-661

SEARCHLIGHT SECTION

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COMPRESSOR: Worthington Dc2-29/18½ x 21, motor 600 H.P. synchronous, 440 volt, with all auxiliary equipment.

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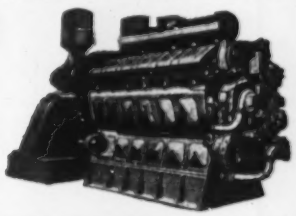

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KW	Make	Model	HP	RPM	KW	Make	Model	HP	RPM
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1500	Fairbanks Morse	33E16	2000	300	300	General Motors	8-268A	450	1200
1136	Fairbanks Morse	38D	1600	720	250	Fairbanks Morse	37-E	375	360
1100	General Motors	16-278A	1600	720	200	General Motors	8-268A	350	900
750	General Motors	12-567	1080	720	150	Worthington	CC-4	225	450
500	Baldwin	VO-8	750	514	150	Buckeye	80	240	600
500	General Motors	8-278A	750	720	100	Worthington	BB-5	150	600
500	General Motors	8-567	720	720	100	General Motors	3-268A	150	1200
400	Ingersoll-Rand	8-8	600	720	60	General Motors	6-71	90	1200
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by R. L. Peurifoy

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You'll make much more realistic estimates with the accurate guidance this book gives you on all major types of construction. Each type is covered in a detail that includes not only the materials, labor, and equipment, but your overhead and profit factors as well.

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These tables give you quick-reference access to such information as the quantities of lumber required for one square foot of wood flooring . . . the approximate price of timber connectors per 100 pieces, f.o.b. factory . . . cost of applying a coat of paint to structural steel . . . cost of butt welds on steel structures . . . machine hours and man hours required to excavate earth for a manhole.

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NEW PRODUCTS

Elevator shaft lined with Blocrete

Fireproofing of shaft with air-placed vermiculite applied in two coats. Job finished in 10 days

Blocrete is the name given to the method of applying vermiculite concrete through an air hose. The successful use of this air-placed lining for fireproofing a hotel elevator shaft was reported earlier this month by the Zonolite Co.

The method is not unlike that employed in shooting concrete mix into place, but is the first reported instance of use of vermiculite in this manner. It replaced cumbersome and extremely heavy formwork, bracing and hoisting.

As the plasterers worked their way up the seven-story shaft they applied a 3½-in. coating over reinforcing. On the descent an additional ½-in. coat was applied and its surface was smooth enough so that no troweling was necessary. The concrete met fire ratings because vermiculite aggregate is incombustible and resists the spread of flames.

In this particular installation—in the Spokane Hotel in Spokane, Wash., —elimination of forming not only saved a tremendous amount of money and time, but permitted use of the hotel stairway throughout the operation. The wall adjoining the stairway is supported on the same studs as one wall of the shaft and, since it is decorated with wallpaper and wood trim, would have had to be replaced at a good deal of expense.

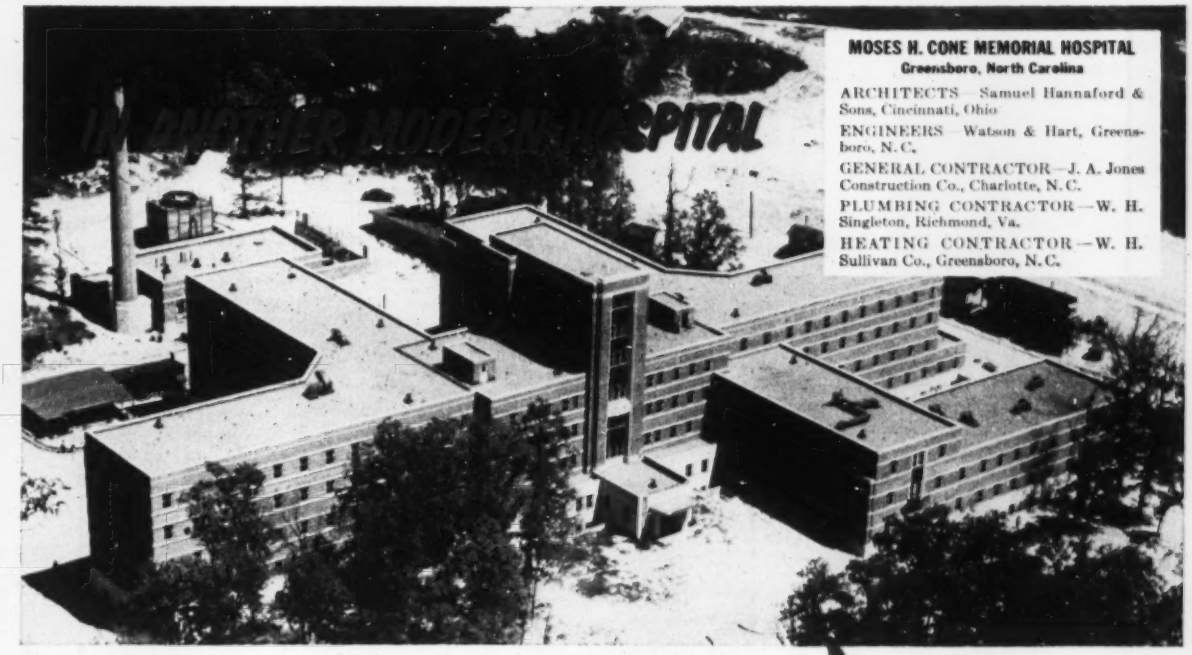
Funk, Molander and Johnson, architectural firm, recommended the technique and the Central Construction Co. was general contractor. Its men set all reinforcing, corner angles and cross members. The actual Blocrete job was sublet to R. L. Montelius Co. and completed in 10 days. All firms have headquarters in Spokane. Zonolite Co., 135 S. Lasalle St., Chicago 3, Ill.

Right-angle gear drive for vertical turbine pumps

A right-angle gear drive has been developed for operating deep well pumps in locations where electricity may not be available or where gas can be used more economically for power. The right-angle gear drive permits use of gas, diesel or gasoline-engine power and is in full production to 70 hp.

Called U. S. Holloshaft, the drive provides constant cycling of oil, visible through a "Lubripeek" window and flush-style "Visolube" oil gauge. The top thrust bearing can be removed easily without disturbing the hollow shaft or gears. A reverse protection clutch prevents the pump shaft from becoming unscrewed in case of torque reversal. Built-in backstops prevent the pump from back-spinning (ENR May 8 '52, p. 138). Tandem mountings of thrust bearings can be arranged to give higher thrust ratings for extra deep pump settings or where large water volume is delivered. An internal water-cooling jacket keeps down the temperature of the sealed oil. U. S. Electrical Motors Inc., Box 2058, Los Angeles 54, Calif.

(*New Products continued on page 81*)



MOSES H. CONE MEMORIAL HOSPITAL
Greensboro, North Carolina

ARCHITECTS—Samuel Hannaford & Sons, Cincinnati, Ohio
ENGINEERS—Watson & Hart, Greensboro, N. C.
GENERAL CONTRACTOR—J. A. Jones Construction Co., Charlotte, N. C.
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BYERS WROUGHT IRON PIPE

GIVES TIME-PROVED PROTECTION AGAINST CORROSION

FIRE LINES
RETURNS
DOWNSPOUTS
DRAINAGE LINES
WASTE and VENTS

Dependability of service and equipment is doubly important in hospitals . . . for failures are not only hard on the budget, but may affect the welfare of the patients.

One phase of the emphasis placed on dependability in this modern hospital, built by private endowment, is the extensive use of Byers Wrought Iron pipe. More than 110 tons of this corrosion resistant material was installed in fire lines, returns, downspouts, drainage lines and waste and vents.

Every one of these services carries a corrosive threat—and every one represents a time-tried genuine wrought iron application. In many reported cases, Byers Wrought Iron pipe has doubled, tripled and even quadrupled the useful service life previously obtained from low-first-cost piping. These outstanding durability records are responsible for the material's wide-spread use in today's modern hospitals in those services where corrosion is a threat to pipe life.

If you are concerned with the construction, replacement or repair of hospital services, you'll find some helpful information in our bulletin, WROUGHT IRON FOR PIPING SYSTEMS. Write for your copy today.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N.Y.

Why Genuine Wrought Iron Lasts

This notch-fracture test specimen illustrates the unique fibrous structure of genuine wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

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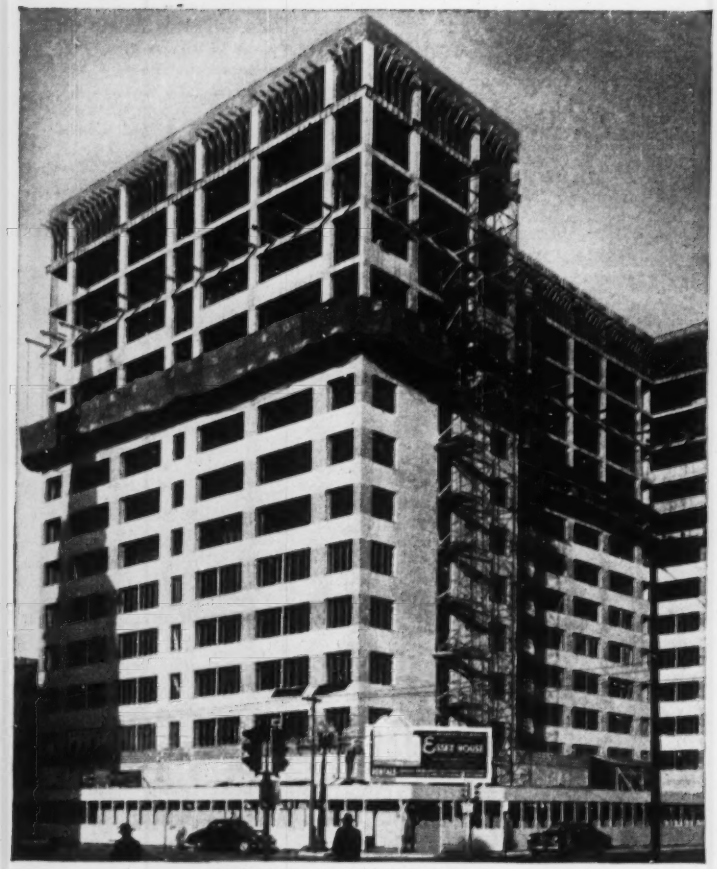
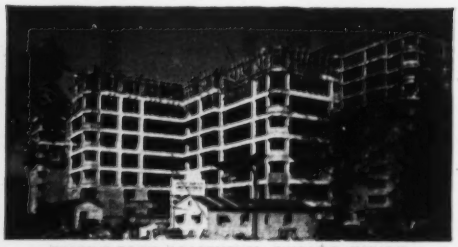
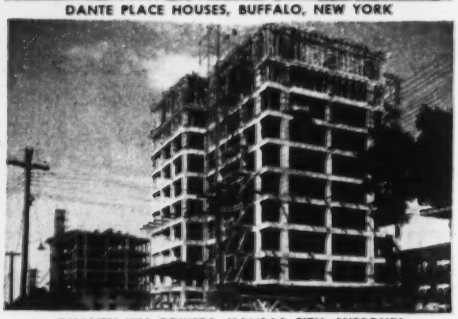


ESSEX HOUSE, INDIANAPOLIS, INDIANA

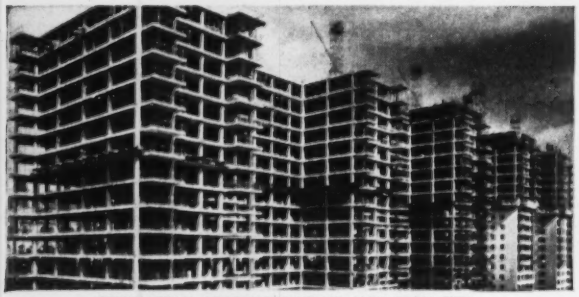


MARINE DRIVE APARTMENTS, CHICAGO, ILLINOIS

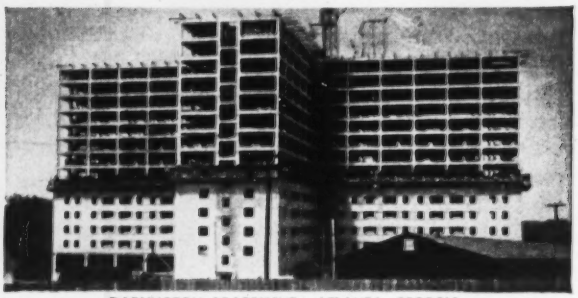
DANTE PLACE HOUSES, BUFFALO, NEW YORK



QUALITY HILL TOWERS, KANSAS CITY, MISSOURI



MANHATTAN APARTMENT HOUSE, NEW YORK CITY



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DEPT. A2d-17, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

Dual-voltage, 5-kw generator can be carried by two men

Homelite's newest generator is the Model 32A-115/230-1. It is a dual-voltage rig, rated at five kilowatts. It will carry a continuous load of 5,000 watts, single phase, 60 cycle, ac at either 115 or 230 volts. A 115-v convenience outlet is supplied along with a 3-pole receptacle for connecting either 115- or 230-v motors, tools and appliances.

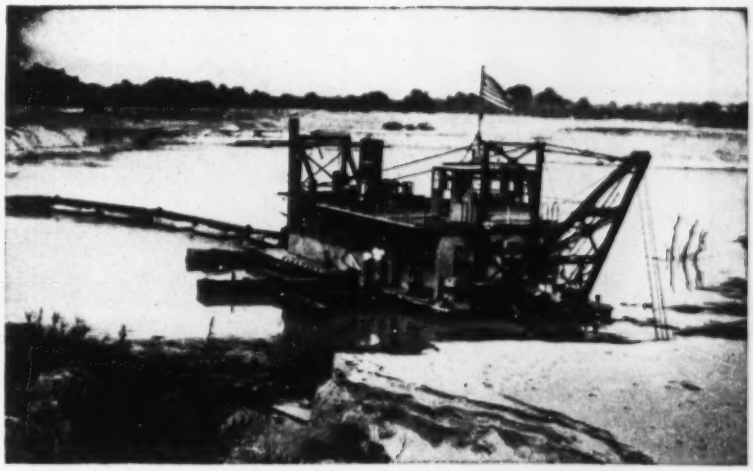
It's powered by a Homelite Model 32 gas engine and the armature is keyed directly to the crankshaft for maximum compactness. Voltage regulation from no load to full load is 4 percent.

The generator has ball and needle bearings at every friction point and a pressure vapor oiling system assures adequate lubrication of all engine parts, according to the manufacturer. Major castings are of aluminum alloy and the unit, complete with engine, weighs only 228 lb. It measures 29 x 24½ x 25½ in. high, with adjustable handles that allow two or four men to carry it. HOMELITE CORP., 67 RIVERDALE AVE., PORT CHESTER, NEW YORK.

Canvas spout for concrete replaced by rubber hose

A rubber hose developed by the Mechanical Goods division of U. S. Rubber Co. to transfer concrete from batch bin to transit mixers is said to outlast the old canvas spout by a ratio of six months to one week.

Although first cost is a good deal higher than in the case of a canvas tube, the manufacturer says that this is compensated for by the long life. In addition, ready-mix companies report that the new hoses remain flexible throughout their life whereas canvas absorbs concrete and stiffens



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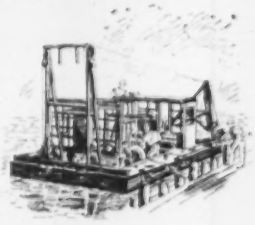
Your dredge is *engineered* to the job!

Designing a dredge is a highly specialized job—and the dredge *you* need must be engineered with *your* problems in mind. That's why Ellicott maintains a large staff of engineers, who consult with you, study your requirements, and recommend the proper equipment for your job.

Ellicott carries through on delivery and assembly!



Perhaps your dredge can be built complete at Ellicott's yard and towed to its destination—or shipped by rail or water and then assembled by Ellicott or you. In any case, Ellicott engineers are there—at your site—when you need them. Ellicott assumes complete responsibility for performance!

Ellicott engineers are always at your service!

At any time while your dredge is in operation, an Ellicott engineer will visit your site . . . perhaps give suggestions for improving performance, or using the dredge for another job. In addition, you are invited *at any time* to request Ellicott to help with any problems you have.

Consult Ellicott on all your dredging problems!

Perhaps you already own dredging equipment that is not doing the job it should. Here, too, Ellicott will be glad to help you. Drop us a line, outlining your problem. And ask for complete, illustrated Catalog No. 825. Address: ELLICOTT MACHINE CORPORATION, 1603 Bush Street, Baltimore 30, Md.

ELLICOTT®

ELLICOTT DREDGES

Thousands of Dollars Saved for the Newark Y.M.C.A.

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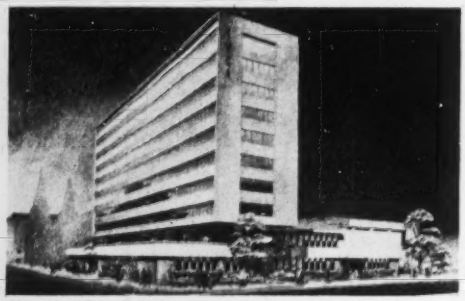

New Y.M.C.A. building, Newark, N. J. 338 Franki Pressure Injected Spread Footings averaging 15 feet depth. Emil A. Schmidlin, Architect, Olaf Egge, Consulting Engineer.

• When put to a special 240-ton test—twice the design loading of 120 tons—the Franki Pressure Injected Spread Footing settled only one-fifth of an inch at the site of the Newark, New Jersey Y. M. C. A. building.

Costs were cut substantially! And time and materials expense was sharply reduced.

In open competition with conventional foundation systems—on projects ranging from blast furnaces to multi-floor office buildings—Franki Pressure Injected Spread Footings are selected over and over again both for safety and for economy. Franki—a forty-year-old, world-wide organization—is the only foundation company providing this unique construction method.

YOU, TOO, CAN LIGHTEN YOUR COSTS WHILE YOU INCREASE YOUR LOAD!

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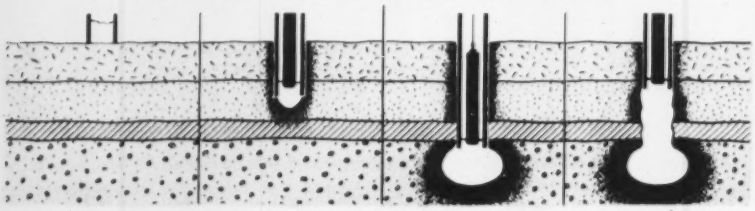
Not Footings . . . Not Pilings . . . Not Caissons

IT'S A PRESSURE INJECTED SPREAD FOOTING



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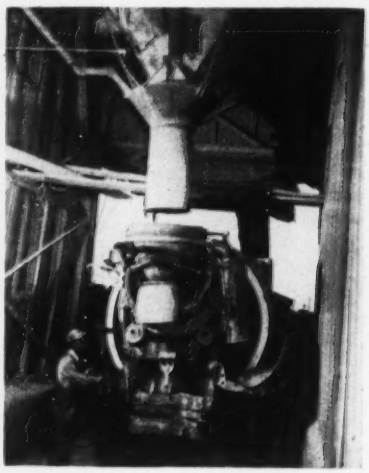


up. The hose also is said to be easier to clean and remains free from clogging. Frequency of spout change will drop considerably, keeping a free flow of expensive equipment running in and out of the mix plant.

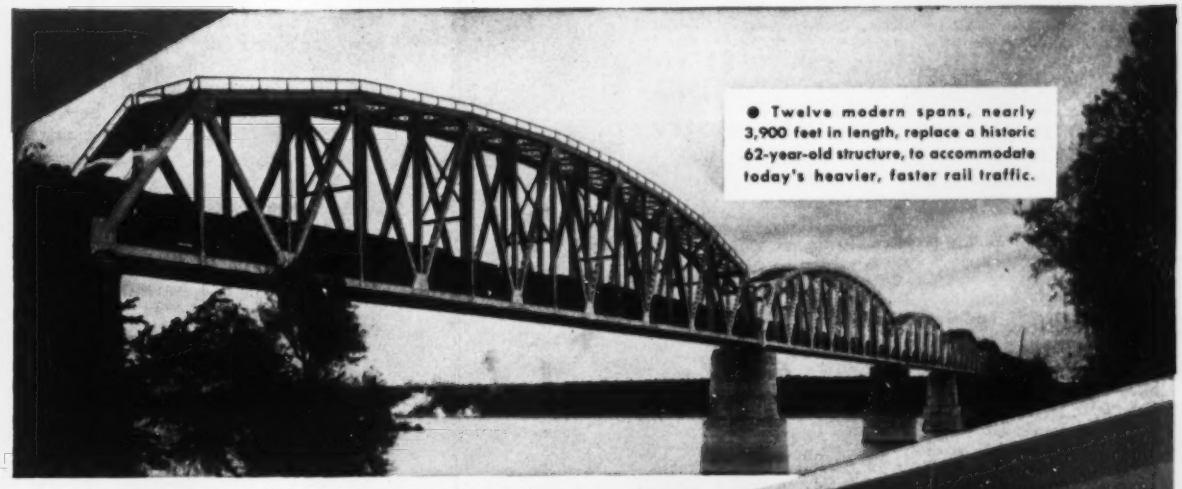
The new hose is made in various sizes ranging from 18 to 24 in. in diameter and in lengths from 18 to 36 in. It's made from natural rubber reinforced with two plies of special fabric. U. S. Rubber Co., Rockefeller Center, New York 20, N. Y.

Flexible electric conduit gets OK for wet locations

Said to be the first of its kind to get Underwriters Labs approval for use in wet locations, the Sealtite flexible electrical conduit Type UA shown here has a tough, extruded synthetic covering over the flexible metal core. This covering is said to protect inner wiring against moisture, oil, dirt, chemicals and corrosive fumes.

The conduit is made from spirally-wound, interlocked, zinc-plated steel

(*Continued on page 84*)



● Twelve modern spans, nearly 3,900 feet in length, replace a historic 62-year-old structure, to accommodate today's heavier, faster rail traffic.

Illinois Central's $6,500,000 Bridge at Cairo, Ill., is Protected by

PITTSBURGH'S NEW

X-L-O

STRUCTURAL - STEEL - PRIMER

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1. Unexcelled wetting properties insure uniform protective coating of steel surface irregularities caused by mill scale.
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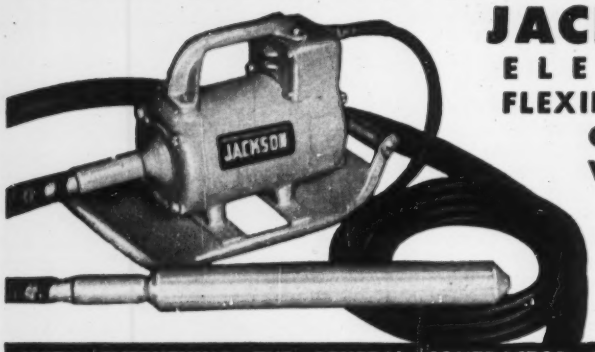

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LIGHT SOCKET OPERATION: Wherever either 115 volt, 60 cycle single phase AC or Direct Current is available, this relatively inexpensive vibrator will do a bang-up job of concrete placement.

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strip with a copper bonding conductor wound spirally in the space between each inside convolution. It can be cut to any required length, cuts easily and is suggested to overcome problems of movement, vibration and misalignment. ID sizes are ⅜ to 1¼ in. inclusive. American Brass Co., Waterbury, Conn.

New product briefs . . .

A submersible sump pump called the "Sub-Drainer" is available from **Jacuzzi Bros. Inc., Richmond, California.** An enclosed on-off switch is sealed inside the stainless steel watertight motor case to guarantee automatic service. There are no separate floats or projecting liquid level controls.

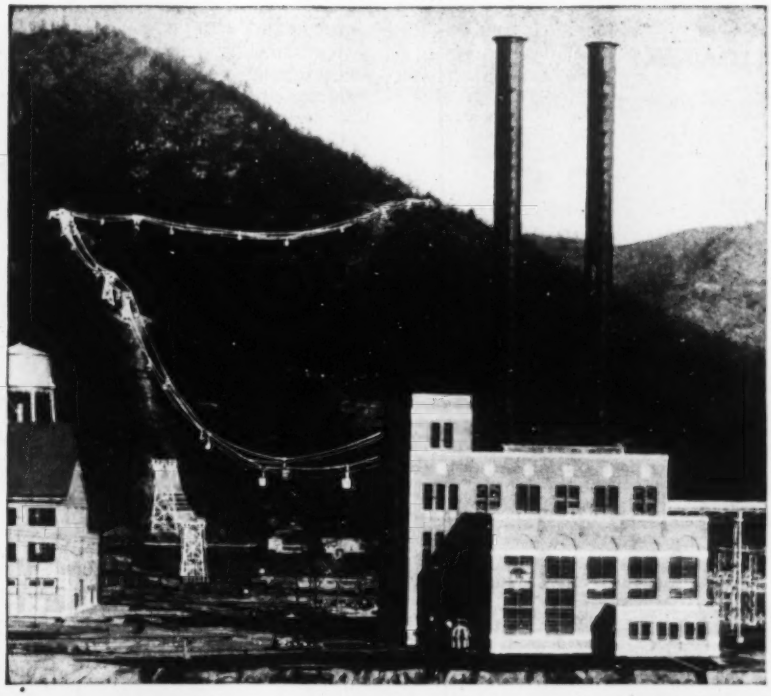
Contractors and dealers working with insulation often end up a job needing just a few more feet. Anticipating this, **Infra Insulation, Inc., of New York City** now packs **100-sq-ft cartons of insulation** as well as the usual 1,000, 500-, or 250-ft units. Cost of installation in new construction between wood beams or studs is claimed to be less than 10¢ per sq ft for material and labor.

A new line of **small, portable arc welders, powered by the company's simplified diesels** is available from **R. H. Sheppard Co., Hanover, Penna.** Said to be the first arc welders of 200-, 300- or 400-amp capacities powered by diesels, they're built as integral units, mounted on four-wheel trailers (or optionally on steel I-beam skids). Smallest unit, with engine, measures 27½x63½x45⅝ in. high.

A five-in-one cutting electrode has been announced by **All-State Welding Alloys Co., Inc., 249 Ferris Ave., White Plains, N. Y.** A 2-to-1 performance is possible, according to the maker, when the new electrode is pitted against other makes in "same heat" tests. Said to be **able to cut, chamfer, bevel, pierce or gouge,** the rod is applicable on steel, stainless steel, iron, cast iron, copper and copper alloys, nickel or nickel alloys, with either ac or dc current. Available in standard sizes from ⅛ to and including ¼ in.

A 48-in. Aluminedge **mason's wood level** is announced by **The Columbian Vise & Mfg. Co., 9023 Bessemer Ave., Cleveland 4, Ohio.** It's **completely enclosed with aluminum** on all edges. Vials are enclosed in new type plastic rings for maximum light reflection and less chance of breakage.

Aerial tramways give low-cost transportation

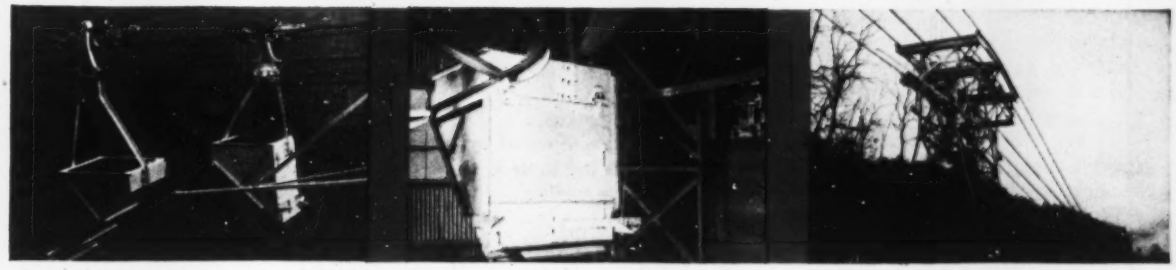


This 8,775 foot bicable tramway has been in continual operation for 23 years, transporting large quantities of coal at low ton-mile cost and giving dependable all-weather service.

The tramway has two stationary track cables and a traction rope that moves continuously in one direction. Buckets clamp to the moving rope at 205 foot intervals and move at 500 feet per minute.

The 48 cu. ft. end dump buckets load and unload automatically. For loading, buckets detach from traction rope, run on graded rails, and attach again after being loaded. Detaching and attaching are also automatic.

This aerial tramway was designed and installed by the Tramway Division of U. S. Steel at the Alloy, West Virginia, plant of Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation.



Conveying materials for a few hundred feet or for several miles, Columbia-Geneva Tramways can be built to handle from 1½ to more than 300 tons hourly. They can be designed to meet almost every type of operating condition, and to handle many kinds of commodities easily and economically—from a tray of optical lenses to a carload of lumber.

Load carriers, like this one on a bicable tramway, are available in many different types and sizes. Services of Columbia-Geneva's Tramway Division include designing the tramway...supplying the steel...excavating for foundations and erecting support structures...furnishing and installing all wire rope, cables, and electrical and mechanical parts.

Tramway support structures are of many types, depending on terrain and job. Because of this flexibility, tramways are free of ground contour, roads, railroads, etc., are unhampered by bad weather, and can climb extremely steep grades. Other advantages: loads can be moved without rehandling and rights-of-way are easier to acquire.

Send for this free manual on aerial tramways. Write on your letterhead today to the Tramway Division, Columbia-Geneva Steel, 141 Battery St., San Francisco 6, Calif. Or for an expert study of your transportation needs, ask for the services of a Tramway Engineer. He can show how an aerial tramway would pay off for you, and he can contract for its design and all phases of its construction, including materials.

Tramway Division

USS

Columbia-Geneva Steel

Division United States Steel Corporation

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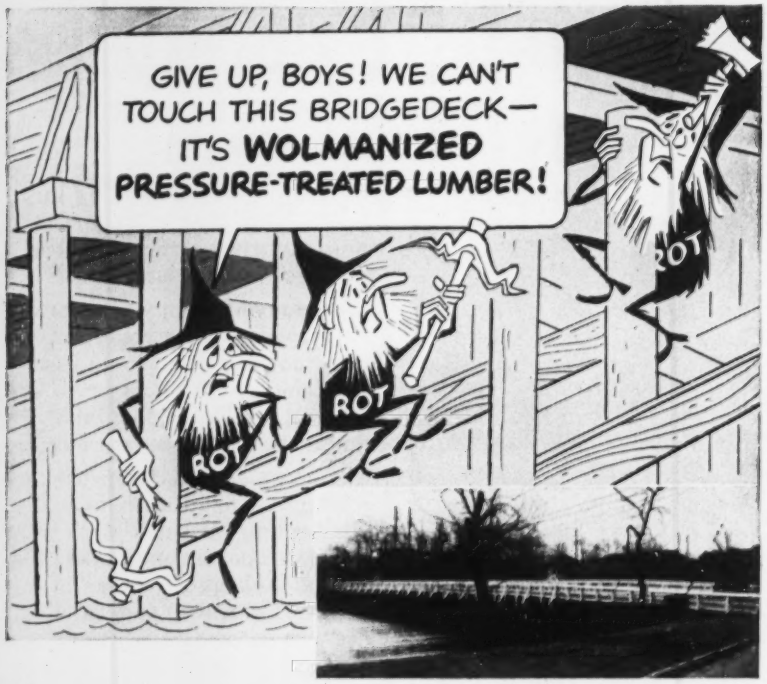

New Jersey highway bridge of wood costs the county 2/3 less . . .

• The 300-foot bridge over Deal Lake in Monmouth County, New Jersey was built in 1941 of treated wood for two reasons: (1) the treated timber structure costs less than a third of what a similar concrete bridge would cost, and (2) the treated lumber resists rot, rust, corrosion and termites. This bridge has now given 11 years of maintenance-free service.

Composite deck construction was chosen for durability and economy. Wolmanized* lumber is a natural in composite construction where direct contact is made between the nail laminated wooden deck and the bituminous concrete roadway surface.

Wolmanized lumber is clean, odorless, paintable, non-leaching. Hundreds of millions of feet of it have been used and have given decades of satisfactory service. The ability of Wolman preservative salts to prevent decay or insect attack makes any lumber last longer in the presence of moisture and termites. There are Wolman preservative treatment plants in all parts of the country. Our representatives will be glad to discuss specific applications. For further information, write:

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PUBLICATIONS

Open Web Steel Joist Construction—A 40-page publication gives standard specifications for open web steel joist construction with safe load tables, plates showing dimensions, sections and properties, recommended building code regulations, code of standard practice and recommendations for handling and erecting joists. STEEL JOIST INSTITUTE, DUPONT CIRCLE BUILDING, 1346 CONNECTICUT AVENUE, N.W., WASHINGTON, 6, D. C.

Safety Equipment—Perhaps the most comprehensive catalog ever put together on safety equipment is available from Boyer-Campbell Co. It contains 144 pages with illustrations and descriptions of all kinds of face shields, welding helmets, skin-coating liquids and creams, safety clothing, machine guards, etc. The catalog is labeled No. 100 and can be obtained from THE BOYER-CAMPBELL CO., 6540 ST. ANTOINE STREET, DETROIT 2, MICHIGAN.

Bar Screens and Disintegrators—Sewage screening and disintegrating equipment are outlined in this two-color, 24-page booklet. With photographs and detail drawings it describes two types of bar screens and the Sulzer disintegrator and shows the units in combination. The disintegrator may be used with manual or mechanically cleaned screens. Write for Bulletin No. 6400, THE DORR COMPANY, ENGINEERS, BARRY PLACE, STAMFORD, CONN.

Hollow Core Floor Slabs—For proponents of either radiant heating panels or of circulated warm air this 6-page folder offers two-color details and complete descriptions of hollow core, precast, long-span concrete floor and roof slabs. The hollow core allows the circulation of warm air, or cold air in the summer, through a floor to baseboard plenums. THE FLEXICORE COMPANY, INC., 1932 EAST MONUMENT AVENUE, DAYTON, OHIO.

Safety Treads—This is a 36-page reference book, pocket-size, that covers practically every type of safety stair tread application. Anyone concerned with the design, application, repair or purchase of safety treads will be greatly aided by this booklet. It has illustrated plates, cross-section drawings, typical installations and specs for Safe-Groove and Abrasive Cast Treads as well as expansion plates, platforms, curb bars and floor grids. Various types, metals and surfaces of Ferrogrit, Alumogrit, Bronzogrit and Nicklogrit are described. WOOSTER PRODUCTS INC., WOOSTER, OHIO.

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EDITORIALS

A blow to compacts

INTERSTATE COMPACTS for the equitable apportionment of water resources received a bad setback this month. It came when a commission appointed last year by the Governor of Pennsylvania recommended that Pennsylvania should not join in a plan for systematic development of the waters of the Delaware River, which has been approved by New York, New Jersey and Delaware (ENR Feb. 19, p. 48). The rejected plan is the result of years of work by the Interstate Commission on the Delaware River Basin (called Incodel for short). Pennsylvania was represented on that commission, and a firm of consulting engineers from Philadelphia participated in the drafting of the specific plan that was included in the legislation that now, presumably, will not be approved by Pennsylvania's legislature.

A discouraging aspect of this situation is the apparent failure of the consulting engineers engaged by the Governor's commission to suggest that the Incodel compact might be modified to be more acceptable to Pennsylvania. Their report has not been made public, but they appear to have favored complete rejection of the pact. As an alternative they proposed the development of needed additional water from the Lehigh River and other tributaries of the Delaware lying nearer to Philadelphia.

The issues raised in any attempt to set up an equitable plan for making the best use of the waters of the Delaware River are admittedly very involved. The principal headwater tributaries lie wholly in New York State, and it is there that New York City, under authority of a decree of the U. S. Supreme Court, is completing the first two stages of its Delaware supply system, which will divert 440 mgd out of the Delaware basin. New York had hoped that the Incodel plan would be approved before it had to start the third stage. Last year, however, the city decided it could wait no longer, and applied to the Supreme Court for authority to divert an additional 360 mgd.

When the Supreme Court authorized the initial diversion it required that the water be obtained by building reservoirs to store flood waters that then were going to waste. It also required that when the gage at Trenton, N. J., on the lower river dropped to a specified point, water must be released from the reservoirs to increase the low flow. The Incodel plan calls for additional reservoirs primarily to add materially to the low flow of the main stem of the Delaware where it forms the boundary between New Jersey and Pennsylvania.

One of the main issues at the moment appears to be whether that augmented flow is worth as much to Pennsylvania as that state would have to pay for it under the Incodel plan. The consultants say it is not. They say also that the relatively large projected diversions out of the Delaware watershed "should not be countenanced." So instead of proposing development of a new pact that would be acceptable to Pennsylvania, they appear to favor opposing before the Supreme Court each future application for higher diversion when it is made.

That is neither a logical nor an equitable way to settle such a question. Both New York City and the communities of northern New Jersey should know now with reasonable accuracy how much water ultimately they can take from the headwaters of the Delaware so that they can develop long-range plans for meeting their water needs.

Possibly the present Incodel plan is not the best that could be evolved from the viewpoint of Pennsylvania. But this is not to say that one could not be drawn that would be acceptable, and which would permit communities needing water from the upper Delaware, more than do any Pennsylvania communities today, to proceed with orderly development. It hardly appears possible that the Supreme Court will permit Pennsylvania to block such development indefinitely just because it is not willing to agree to a division of the available waters until it begins to have a real need for some part of them.

State compacts are too valuable a device for the equitable division of river waters to be discarded in favor of continuous legal maneuvering and expense.

Senseless jitters

OBJECTIONS RAISED by the Atomic Energy Commission to the construction of a dam at Priest Rapids on the Columbia River (ENR Feb. 5, p.27) just do not make sense. The commission holds that the proposed dam could be reduced to rubble by an atomic bomb attack, and that the released water would move down on its Hanford plutonium plant in a wall of water 150-ft high that would engulf the plant so quickly that it could not be shut down fast enough to avoid a catastrophe.

Presumably an atomic bomb could destroy a dam, but released water does not move in "walls." By the time the water reached Hanford it would be spread out to only a fraction of a 150 ft depth. The important consideration, however, is the remote possibility of bombing. Why should an enemy bomber try to pinpoint a dam, when the prime target, the plant itself, is nearby and so much larger?

Both the Army Engineers and a local utility district have expressed a desire to develop the power at Priest Rapids. If Congress should believe what the AEC says, the end result might be that neither of these agencies would be permitted to build the dam. That would deprive an area of power, which is claimed to be vital for its future growth. The AEC should reexamine its conclusions.

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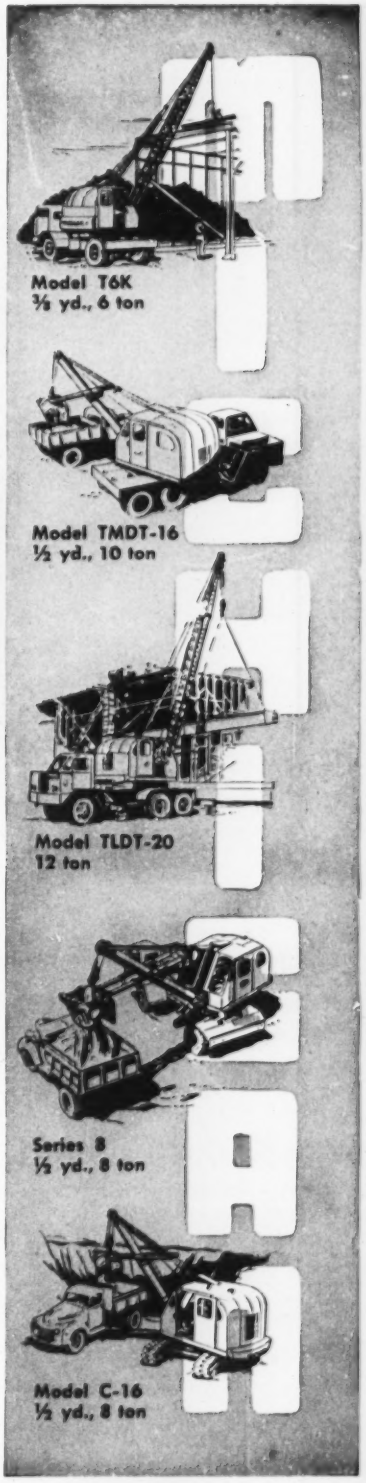

TIMKEN® bearings in 64 wheels carry 300-ton load

WHEN the government needed a trailer that could move a 300-ton load over desert sands for a military test, Rogers Brothers Corporation designed and built this 64-wheel trailer.

To carry the 600,000 pound load, Rogers' engineers specified Timken® tapered roller bearings for each of the 64 wheels. On improved roads, this giant trailer, equipped with standard heavy-duty tires, had an unprecedented capacity of 600 tons.

Timken tapered roller bearings are rugged. Line contact between the rollers and races of Timken bearings gives them extra load-carrying capacity. Smooth, trouble-free performance is assured. Timken bearings take radial and thrust loads in *any* combination because of their tapered construction.

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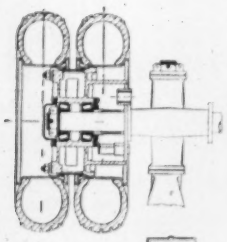
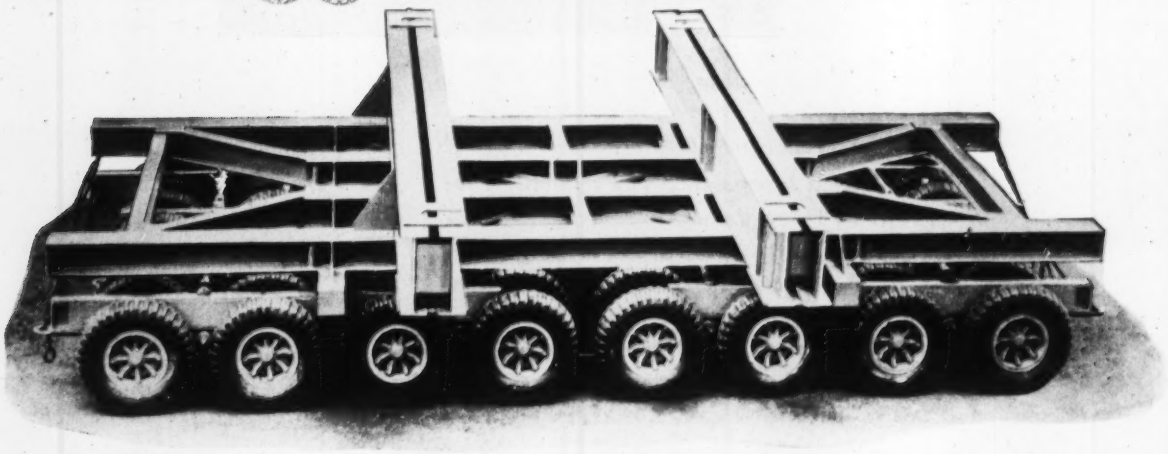
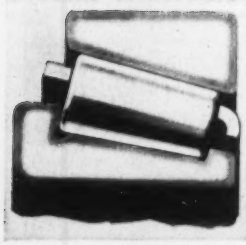
No other bearings can give you all the advantages of Timken bearings. Specify Timken bearings in the machines you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How ROGERS BROTHERS CORP. mounts the wheels of its 300-ton trailer on Timken tapered roller bearings. Timken S.A.E. 4140 steel is also used for the axles.





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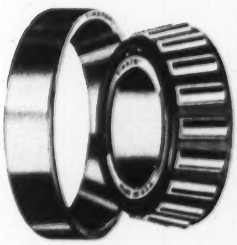

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